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SUGGESTIONS AS TO CAUSES OF LOW PERCENTAGES OF CURES IN OPERATIONS FOR FISTULA IN ANO.

A METHOD OF OPERATING BY WHICH THE CONTOUR OF THE ANUS AND THE FUNCTIONS OF THE SPHINCTER MUSCLES ARE PRESERVED.[1]

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One of the first questions a patient suffering from fistula in ano usually asks his surgeon is, "Doctor, will I be cured sound and well after the operation?" And the second is, "Will I have full and complete control over my bowels after recovery?"

The hospital investigations by Tuttle[2] concerning the results obtained in the treatment of fistula in ano will greatly aid in answering the first question. He says: "A very large percentage, if not a majority of the cases of fistula operated upon in hospitals and treated by general surgeons, are failures so far as cure is concerned." He supports this statement by reports obtained from a search of the hospital records which he says, "reveals the fact that while nearly all the cases of fistula treated are said to be improved, less than 45% out of 2,196 cases collected are even claimed to have been cured." He further states: "That these statistics do not distinguish between the different varieties anatomically or pathologically, and therefore, no positive conclusions can be drawn from them." Continuing, he says: "It is reasonable to suppose, however, that those of the simple subtegumentary type were all cured.

"Assuming this to be true, the percentage of failures in the other classes will be largely increased. If these patients had been cured there is no doubt that they would have been entered so upon the hospital records; and, therefore, it is concluded that the treatment of this condition in general hospitals is far from satisfactory."

While I have never made a personal investigation of the results obtained in the treatment of fistula in ano, in our hospitals, I am free to admit that this was quite a revelation to me. I have heard more or less complaint among surgeons about the great difficulty experienced in successfully operating upon cases of complicated fistula, and have experienced some difficulty myself, yet I never imagined that a search of the hospital records would reveal such an extraordinarily low percentage of cures among general surgeons. What is the cause of this low percentage of cures among general surgeons in the operation for fistula?

Is it due to the fact that fistula is such an insidious disease; and, therefore, such an obstinate ailment to treat?

Is it due to the fact that the subject of proctology has not been given that careful attention it so indubitably deserves by our medical colleges? or,

Is it due to the teachings and advice contained in some of our books on rectal diseases and general surgery?

Since these three questions include the proposition we have before us for consideration and the sources of our information for recognizing and treating the subject of fistula in ano, let us briefly consider each of them serially before forming our conclusions.

(1) Is it due to the fact that fistula is such an insidious disease; and, therefore, such an obstinate ailment to treat?

If so, is the subject of fistula in ano receiving its quota of original research and investigation? Mr. Allingham tells us, that in the whole range of surgery, he knows of no ailment that requires more technic and skill to cure than that of a complicated case of fistula in ano; and my friend, Dr. Mathews[3] says: "I believe that it requires a more careful surgical operation to cure a complicated fistula in ano, than almost any other surgical disease."

In view of the opinion of these eminent authorities, and the foregoing report as made by Tuttle; Is it not true that more thought should be given to this distressing and secretly infecting disease?

(2) Is it due to the fact that the subject of proctology has not been given the careful attention

[1] Read before the Chicago Medical Society (Cook Co. Medical Society), Feb. 6, 1907.

[2] Diseases of the Anus, Rectum, and Pelvic Colon. By James P. Tuttle, M. D. D. Appleton & Co., New York. 1902.

[3] Diseases of the Rectum, Anus and Sigmoid Flexure. By J. M. Mathews, M. D. D. Appleton & Co., New York, 1908.

it so indubitably deserves by our medical colleges? In a previous paper[4], I laid stress upon the fact that the subject of proctology has been more or less neglected by our medical colleges; that I have been led to conclude from personal observations and experience, extending over a period of ten years in lecturing at the Chicago Policlinic and other postgraduate schools, that the average physician considers this class of diseases as though they were segregated, so to speak. Because when addressing a class of physicians upon the subject of treating hemorrhoids, for example, it is not at all uncommon for one or more of them to interrupt and ask: "Doctor, how do you control the hemorrhage?" I usually reply by asking another question which is about as follows: "Doctor, how do you control the hemorrhage when you amputate a limb?" "Why I catch up the bleeding vessel and twist it, or tie a ligature around it." I immediately reply: "Certainly, doctor, that is good practice. Now can you give me any good reason why you should not do the same thing when operating on hemorrhoids?" He sees the point immediately.

That question settled, I frequently ask another which is something like the following: "Doctor, how many lectures did you hear on the subject of rectal diseases when you were a student, and about how many clinical cases and rectal operations did you see?" The answer is usually as follows: "I never heard a lecture on rectal diseases in my life, and I never saw more than one or two rectal operations." While occasionally there will be a few who have received good preliminary instruction in this subject, yet many of them have never witnessed a rectal examination nor an operation on the rectum. These physicians include those of recent graduation as well as those who have been practicing for a number of years.

Because of the character of the information obtained, I examined the catalog of every medical school in this country and Canada, that I could obtain. I found, with few exceptions, that proctology is not taught in our medical colleges.

This is not right. It is the duty of every medical college to make provisions for teaching the fundamental principles of this department of medicine, and that college that does not, is derelict in its duty. I do not mean by this that specialists should be made of these students, but I do mean that they are entitled to, and that they should receive, a foundation in proctology as well as in gynecology, genitourinary and other diseases because no class of diseases in the whole range of medicine and surgery, is productive of more misery and suffering, or more secretly infect and undermine the constitution, than those of the anus and rectum. Then why this inadvertence? It must be an oversight on the part of the colleges, as I do not believe they are unmindful of the great importance of this class of diseases.

The American College Association has adopted a uniform curriculum consisting of twenty-seven subjects. No reference whatever is made in this extensive course to the subject of rectal diseases. Yet it provides for thirty hours to be given each to medical jurisprudence, dietetics, hygiene, and public health; sixty hours each to electrotherapeutics, nose and throat, and genitourinary diseases, and one hundred and sixty hours to gynecology, but not a single moment to the subject of rectal diseases. Notwithstanding this omission no class of diseases more thoroughly and completely taxes the surgeon's ingenuity, skill, and technic than many of those that come within the domain of the proctologist, and the statistics just cited concerning the low percentage of cures in the operation for fistula, confirm this assertion.

In view of the fact that the greatest breach in the science of medicine to-day is, and always has been, at this very point, and that it is proverbially true that because of this breach the advertising charlatan is more securely intrenched in this than in any of the other departments of medicine, I fail to see the equity in such a curriculum.

It may be claimed by the association of colleges and those schools that do not include proctology in their curriculum, that the chairs of general surgery devote a certain number of hours to these diseases. If so, why are there so many reputable physicians practicing in this country who have never heard a lecture on rectal diseases nor witnessed an anorectal examination or operation? Can this be true and the chairs of general surgery performing their duty?

It cannot be gainsaid that the instructions and technic in rectal surgery should be second to that of no other specialty or department in the science of medicine. When it is, the hospital records will not show such a low percentage of cures in operations for fistula. I, therefore, repeat and without reservation that it is the unquestioned duty of every medical college to give more attention to the subject of rectal diseases. That proctologic knowledge should become more thorough, its distributions more widespread and, therefore, more beneficial to humanity, cannot be questioned.

[4] Address of the President of the American Proctological Society. By J. Rawson Pennington, M. D. *American Medicine*, July 15, 1905.

(3) Is it due to the teachings and advice contained in some of our books on rectal diseases and general surgery? These teachings, speaking in a general way and without quoting from any particular book, are practically as follows: The operation for fistula is usually a very simple one. If the tract is tortuous and the internal opening not easily found and the probe is felt under the mucus membrane it should be pushed through and guided by the finger out of the anus and all of the tissues remaining upon it divided. Further search should be made with a probe along the line of the cut which will likely run into an additional sinus from the main tract. Such another tract should be laid open.

All of this looks quite easy and simple on paper, and a novice would at once think the operation of fistula a very easy and simple procedure; that it would be quite an easy matter to detect the opening of the original tract and any extension after the first incision had been made. I assure you that such is not the case, that the field of operation looks quite different from that of the printed page of a text-book, and especially is this true when a complicated fistula is the point in question. What makes it still more difficult is the fact that you cannot always tell whether or not you have a simple or a complicated case with which to deal until after the first incision has been made. What may seem to be a very simple and complete fistula, may, upon laying open the main sinus, prove to be a very complicated and difficult case, with sinuses extending in various directions and far into the tissues, and to deal with this effectively, requires proficient knowledge, dexterity, and prudence.

Not finding the continuation of the tract one concludes that he has divided it, only to be disappointed at the end of one to six months when he finds that his patient still has his fistula.

The successful operation for fistula depends upon finding and laying open the entire fistulous tract, or tracts, including the internal opening. Puncturing the rectal wall at some point and laying the tissues over it open, and failing to find and lay open the internal opening is almost sure to result in failure to cure, because a part of the fistula remains untouched. On this point we cannot speak too strongly. "It is certain that one can never guarantee the healing of a fistula so long as any lateral or deep sinuses remain; and so long as they do remain fresh sinuses are apt to form." (Allingham.)

Some of these same books also state that the after-treatment is simple. That the operated fistula should be packed with iodoformized gauze with the minutest care until it heals. Such teachings cause much harm. The after-treatment of the fistula requires *more* than ordinary care.

It is my observation that to pack the operated fistula daily with gauze is to cause a large cicatrix and sulcus, which means an irregular contour of the anus that is difficult to keep clean, with more or less loss of control over flatus and liquid feces. What more pitiful condition can one imagine than that of an otherwise healthy, respectful, and refined citizen, who is compelled to shun society because of the mortification and perpetual fear of being in any way offensive to others. Incontinence of feces is an exceedingly distressing condition for the patient who often expresses a desire to die rather than to live. I do hesitate to state that any surgeon who follows such teachings and advice must of necessity meet with failure after failure.

In view of the foregoing statistics, lack of instruction in rectal diseases by our medical colleges and the teachings and advice contained in some of our medical books, where is the blame, if there is any, for these failures to cure, to be placed?

With reference to the second question: "Will I have full and complete control over my bowels after recovery?", the loss of control over the bowel, or incontinence, does not occur as frequently as some would have us believe. Yet that it does occur in spite of the most careful present-day surgery, all know. A trivial operation is sometimes followed by more or less loss of control, while after a very extensive one, the patient may still retain control over the outlet. Why this is so, has not as yet been satisfactorily answered.

Some authorities tell us that where the entire sphincter is cut and the edges of the wound retraced to a considerable distance, one must always be prepared to meet with a certain amount of incontinence. In those cases in which the sinus passes outside of, and enters the bowel above the internal sphincter, Goodsall[5] advises trying to effect its closure by injections of nitrate of silver. He says: "When, after repeated applications, the sinus still remain unhealed, it is better to leave it alone than to incur the risk of probable incontinence by division of the internal sphincter for the cure of the fistula. One should be cautioned against the possibility of great harm in this use of nitrate of silver in these cases.

"In fact," he say, "the patient should be urged to tolerate the persistence of his fistula rather than take the risk of the loss of power of control over

[5] Diseases of the Anus and Rectum. By D. H. Goodsall, F.R.C.S. (Eng.), and W. Ernest Miles, F.R.C.S. (Eng.), Longmans, Green & Co., London.

the contents of the rectum." He further says: "In such a case the sinus quickly heals after the division of the internal sphincter, with the result that, though the fistula has been cured, incontinence of feces probably takes its place, leaving the patient totally unfit for many occupations, and in a deplorable condition so far as his personal comfort is concerned.

"It is, therefore, most desirable that a deep sinus passing outside the internal sphincter should be cured without recourse to division of this muscle."

He further states that in operating upon a case of anterior horse-shoe fistula, when the main sinus passes into the rectum through or deeper than the internal sphincter it should not be laid open. Should the internal sphincter be divided, the patient will certainly have more or less permanent loss of control over the contents of the rectum.

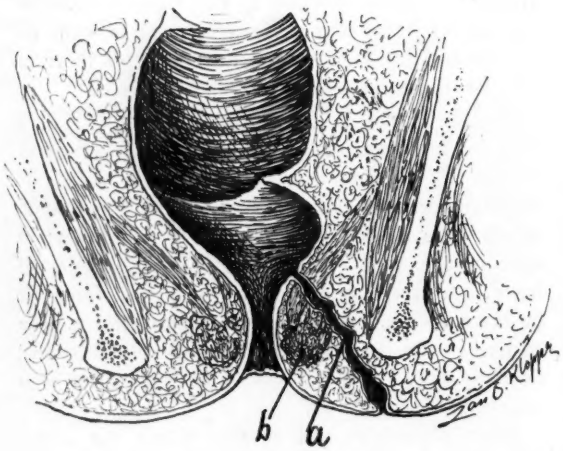

Fig. 1 Diagrammatic Sketch: a, Represents a Complete Fistula; b, the Tissues Between the Fistula and the Anal Canal.

These words of caution from Mr. Goodsall are from one who has probably had as much experience in the treatment of fistula as any living surgeon.

Let me briefly repeat (1) that less than 45% of the cases of fistula operated upon in hospitals, are even claimed to have been cured; (2) that when the external sphincter is divided that a certain amount of loss of control may be expected; (3) that those cases where the internal opening is above the internal sphincter the patient should be advised not to be operated on and take the risk of incontinence, but to bear with his fistula; (4) that incontinence does follow a certain percentage of these operations in spite of every precaution; (5) that frequently the operator cannot tell the extent of the disease nor its complications until he begins to operate; and (6) that it requires from three to six months to cure an extensive fistula. I say that it is only when we are brought face to face with such statistics, facts, advice, and results, that we begin to realize what a baneful disease fistula in ano is, and the technic and skill one must exercise to effect its cure.

The question, therefore, naturally arises, can any operative or preoperative procedure be utilized so as to minimize the possibility of incontinence and preserve the contour of the anus and functions of the sphincter muscles in operating for a complete fistula?

Practical experience has demonstrated that much can be done to preserve these functions by operating as follows:[6] The patient having been prepared in the usual manner, all of the fistulous tracts, Fig. 1, are injected (when deemed necessary), with some coloring solution as methylene blue to aid in searching

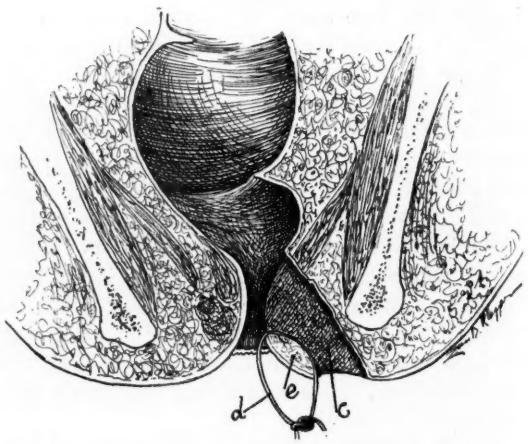

Fig. 2. Diagrammatic, (Side View): c, Illustrates Scope of the Incision on the Distal (Toward the Skin) Side of the Fistula; c, the Tissues Remaining and Undivided; d, the Seton Passed Around Them and Tied.

out the course of the tract or tracts. Then all of the fistulous tracts external to the sphincter, except the one entering the rectum, are divided. A probe pointed director is passed into the rectum through this tract and an incision made on its distal (toward the skin) side. This incision should be made so as to include most of the fibers of the external sphincter, and to locate the transferred internal opening at or near the anal margin, Figs. 2 and 3. Salmon's "back cut" should then be made on the proximal side of the tract, especially if the fistula is of long standing and the tract is fibrous. Then a seton is passed through the opening entering the bowel and

[6] A New Method of Operating for Fistula in Ano by Which the Contour of the Anus and Functions of the Sphincter Muscles Are Preserved. By J. Rawson Pennington, M.D. *Journal of the American Medical Association.*

tied loosely around the tissues remaining and undivided. Figs. 2 and 3. The wound is dressed as after the ordinary incision operation for fistula. At the end of twenty-four or thirty-six hours, it is redressed, being careful to dress the wound so that the opening entering the bowel will be made to heal from the proximal toward the distal side. The object is to advance the fistulous tract as far distally or toward the skin side as the case will permit, so that, it will pass through the fibers of the external sphincters, when the healing process is complete.

As a rule the enlarged tract entering the bowel, except that through which the seton passes, will soon close. When this occurs the seton may be removed; and, by the time the external wound is healed, the tract entering the bowel will possibly have closed also. Should it not, at any time later, this little tract, which will usually not be more than one inch in length, may be dissected out, and the remaining fibers of the muscle sewed together.

The adoption of this procedure in operating not

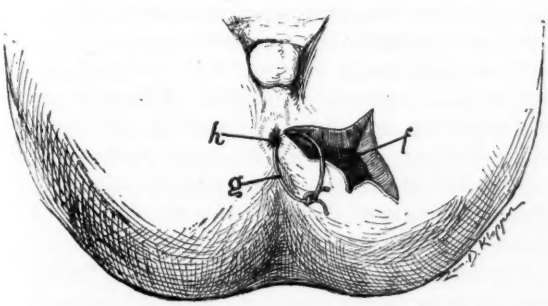

Fig. 3. Diagrammatic, (Full View): f, Illustrates the Incision of the Fistulous Tracts External to the Sphincter; g, the Seton Passed Through the Opening Into the Anal Canal and Out Through the Anus.

only lessens the sulcus that usually follows these operations, but aids in preserving the contour of the anus and the functions of the sphincters.

Should the seton be left *in situ* until the wound is completely healed, a small nonsecreting fistula will be seen entering the anal canal. This may be dissected out and sewed together at will. Sometimes this opening will give no annoyance and finally close without further interference.

Should the remaining tissues in this case simply be divided, without dissecting out the tract, mutilation of the contour of the anus and loss of control to a certain extent might follow. In such a case the entire tract should be dissected out and the ends of the muscle united. This may be done either under local or general anesthesia. It is best performed, however, under the latter.

The question might arise: What is the use of the seton? Would it not be just as well, or even better not to use it? No. By using it the opening into the bowel is transformed and transferred to a point near the skin and the incision, through its use, made to heal from the proximal towards the distal side; or, in other words, with it you can direct and greatly control the healing process and location of the final fistulous tract.

It seems to be the consensus of opinion that the large majority of cases of incontinence following operations for fistula could be avoided if the external sphincter were cut squarely across and the ends sutured together. The seton method preprovides for this procedure.

The anus not being divided aids the healing of the external wound and prevents much of the contraction and atrophy usually observed after these operations.

By employing this method of operating we simply have an external wound with which to contend. The anus is not mutilated nor disturbed to any great extent and in some cases not at all, and the patient is usually up and around in a few days. Moreover, the action of the bowels does not soil the wound.

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THE PULSE IN APPENDICITIS.

The pulse by which the practitioner, by custom and by tradition, feels that he can read more clearly than in any other way the true condition of the patient, is just as deceptive as leucocytosis and temperature. A strong and bounding pulse, rapid in character, accompanied by fever, is an indication of the stimulating effect of an irritating toxin that is absorbed. A rapid and small pulse indicates the absorption of a toxin that is depressant; such as occurs from saprogenic infection. This is only marked when a severe infection exists. There are conditions where the pulse is normal, and hence the patient is supposed to be in little danger. In these cases the temperature, pain, and general condition of the patient must be the guide to what is going on in the abdomen.

In my judgment it [the "normal pulse"] is the direct result of the absorption of toxins of the two distinct infectious elements: one which stimulates, and one which depresses. A mixed infection having taken place, two toxins, one of a stimulating and another of a depressing character, are produced and result is a pathological tug of war upon the **innervation of the heart; the result is an apparently normal pulse, but in reality a very pathological pulse.**—Ernest Laplace in *Medicine.*

SOME PRACTICAL POINTS CONCERNING CERTAIN JOINT INJURIES AND DISEASES.*

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The various articulations of the body are peculiarly susceptible to injuries of a certain class, and also to invasion by many forms of infection. Joint injuries are usually the result of direct violence, a blow or fall being the cause of the majority of injuries we are called to see. Of the infections we have to contend with we must mention tuberculosis at the head of the bone, gonorrhea, and rheumatism closely following, the other infections and pyogenic bacteria adding to the numbers in not inconsiderable proportions.

The joints affected, with regard to their importance and frequency of involvement, are respectively the knee, hip, elbow, ankle and shoulder. To attempt to cover the entire subject of joint injuries and diseases is entirely out of the question, and you would have only the substance of such articles as are exhaustively treated in text-books, so my paper will be a description of a few cases that have been of particular interest and value to me.

Two of these cases were injuries of the elbow, the histories of which are as follows:

CASE I.—Boy, aged 17, employed in a factory to run an auger machine, cutting a circle two inches in diameter. In some manner the machine caught the boy's coat sleeve, drawing the elbow into the auger. Fortunately the coat sleeve was rotten and tore away from the body of the coat, otherwise the arm would have been horribly mangled. As it was the injury was confined to the elbow joint, and when seen by me, half an hour after the accident, I discovered the joint to have been torn open over the olecranon process, and the olecranon split down the center. The head of the radius and the base of the humerus were also bitten into, but not sufficient to cause any probable functional disturbance. The arm was thoroughly cleansed with soap and water, shaved, cleansed with alcohol and ether, the portions of the olecranon and radius that had been chipped away were removed and the capsular ligament sutured over and closed. The skin was closed over this without drainage, and dressed with the arm extended upon a straight splint. Primary healing was secured with no deformity, and no greater disability than the apparent weakness on extending the arm, caused by the limited attachment of the triceps upon half instead of the whole of the olecranon.

CASE II.—This was that of a boy employed in one of the glass factories who, in scuffling with another, was tripped and thrown to the ground upon a lot of glass, the other fellow falling upon the boy's left arm and elbow. I saw the case about an hour after the injury, and found the elbow joint opened up by a cut over the olecranon, which had also cut the posterior portion of the capsular ligament open for a distance of over an inch. The wound was fearfully dirty, small pieces of cinders and glass being ground into it. It was cleansed as in the first case. I sutured the capsule of the joint and drained the skin wound. In twenty-four hours the boy had a temperature of 103, and, on redressing, the arm was found swollen. Alcohol compresses were applied and the dressing was kept saturated with equal parts of glycerin and alcohol. This mixture represents all the virtues of the different mud poultices, with the additional benefit of the alcohol. Gauze saturated with this mixture and covered with an outside dressing of oiled silk represents a handier, cleaner and more hygroscopic poultice than any clay poultice on the market. It is also cheaper and always at hand. It requires no heating, spreading or mussing with and gives one a forty per cent. alcohol dressing, which is a marked antiseptic. If there is any discharge, the dressing will absorb it, something which does not occur with the other poultices; in fact, we cannot use such remedies as antiphlogistine over a discharging wound unless we provide an outlet.

The stimulation from the above dressing in this case of elbow injury caused a rapid subsidence of the pain and fever, and in four days the temperature was normal. In ten days the wound had entirely healed on the outside. The inside wound of the capsular ligament had closed primarily preventing a synovitis. The infection was limited to the skin, a dermititis called by Senn "erysipeloid," a form of inflammation I have observed in one other case only. After the first reaction the skin began to assume a violet-red hue; the swelling was progressive and gradually extended for two weeks until it reached half way to the shoulder and down towards the wrist. There was no fever after the fourth day, and the pulse showed little or no reaction. There was no pain and little or no tenderness, although some trace of it was visible at the margins of the wound for nearly three weeks. The other case of "erysipeloid" inflammation observed by me was that of a woman who had fallen from a step-ladder, striking her shinbone and producing an abrasion that appeared innocent enough for several days. Swelling then appeared and slowly pro-

* Read before the Indiana State Medical Society.

gressed for four weeks. There was no fever or pain at any time. There was no special symptomatic constitutional disturbance and no added disability save the unhealthy and slow healing of a very small wound. In both of the patients there was a decided neurotic tendency.

CASE III was that of a boy, who had been accidentally shot with a flobert rifle. The bullet entered the left knee joint, passing from the outer side on a level with the condyles of the femur, through the skin and under the quadriceps tendon. The bullet not lodging where it interfered with the motion of the joint, the skin wound was opened up and thoroughly curetted and cleansed, the margins of the wound were trimmed away and the skin wound closed without drainage. The limb was dressed in an extended position, and the boy made an uninterrupted recovery.

There is but one locality where it is demanded of the surgeon to remove a bullet in spite of its apparently benign presence after the injury. This exception is the lodgment of a bullet in the brain. I have seen seven of these cases in my experience, most of which were in Dr. Murphy's service in Chicago.

Following an operation in which the bullet had been located with the X-ray pictures, Dr. Murphy made this remark: "It is surprising the amount of damage a bullet can cause in the brain substance, and more remarkable is the little apparent disability it produces afterwards. Nevertheless this temporary well-being is but a transient one of varying duration. My observation of this class of cases shows that all of them, sooner or later, will become mental defectives unless the bullet is removed."

Whether the after-results due to the chemical action of the lead or the pressure of the lead which has dropped by its own weight from its original position to one producing pressure upon some vital center, is not definitely decided, yet it is a fact that no bullet can remain in the brain substance any length of time without producing serious and ultimately fatal consequences.

CASE IV.—This case is mentioned because of its peculiarity only. It was that of a ball player who, in attempting to catch a foul tip, had the ball strike him upon the end of the left thumb. The thumb was in such a position that the full force of the ball was expended upon the metacarpophalangeal joint. The head of the first phalanx of the thumb was dislocated backwards and driven through the skin. When seen by me the head of the bone was protruding through a clean straight tear of the skin over the metacarpophalangeal joint. The sheath of the joint was torn apart and the bone had passed between the two extensor tendons. The parts were thoroughly cleansed and the dislocation reduced. The tears were sewn up and the thumb dressed in extension. There was no pain or tenderness necessitating a change of dressing for several days. On the eighth day I removed the skin sutures. In two weeks the thumb was taken from the dressings, the function of the joining again being normal.

Compound dislocations and all compound injuries of the joints call for a maximum knowledge of the principles of cleanliness. Every open joint should be treated with the same care in its attention as one would give to the peritoneal cavity. The limb should be scrubbed from the nearest joints above and below, or for a sufficiently safe distance on either side. Following a thorough scrubbing the parts should be shaved and scrubbed with some ethereal soap, of which we have a number of excellent makes on the market. Following this scrubbing, the use of alcohol and ether will dissolve out some of the grease from the pores of the skin and take with it a further number of possible dangerous bacteria. This result can be obtained with soap and water alone which in some cases is more efficacious, but requires considerably more time and a continuous maceration of the tissues with the soap solution. A scrub brush applied to a relatively clean skin is productive of more damage than good. It produces abrasions that give an extra nidus for infection. If the brush is applied with sufficient vigor to produce results a dermatitis will ensue and cause an infection of an otherwise clean wound. Soap and plenty of boiled water before and after shaving are the means that must be employed to secure clean results. If these simple measures are used properly and sufficiently, you will have no occasion to use antiseptics in any form. No powders or solutions are needed about the joint. Nothing is needed save sterile dressings and sutures. In this place let me suggest a new material that, in my hands, has proven more valuable than either silkworm gut or catgut for general work. I refer to the so-called "celluloidin." It is simply a linen thread saturated with a preparation of celluloid. It can be perfectly sterilized by boiling, and repeated boilings do not weaken the strength of the thread. It can be used for everything save where an absorbable suture is required. It is cheaper than silk or silkworm gut. It possesses all the advantages of both these sutures, with none of their disadvantages.

The after-care of joint injuries is a subject that has recently aroused considerable discussion. The

question of active and passive manipulations, massage and period of immobilization has been discussed pro and con for some time. All of these are factors of importance at some time during canvalescence. These things, however, must be remembered:

1. A joint injury in which the bones are involved, without the probability of a permanent deformity, should be placed at absolute rest and kept there for a period long enough to allow of a complete reparative process to have occurred in the bony lesion. The dangers of a stiff joint are little or none in comparison with the possibilities of nonunion.

2. The joints may be stiff, and there may be adhesions, but these can be easily overcome. Some cases may seem so painful in the manipulation that they may require an anesthetic, in which instance it is well to make complete restoration of motion. The use of ethyl chloride will be found ideal in these cases, for it produces immediate anesthesia, seldom requiring over a minute for narcosis if the regular ethyl chloride inhaler is used. The recovery is as prompt, and the dangers, complications and after-effects are practically none.

Active and passive motion should be attempted only at such a time as we can feel there may be no inflammation which may be renewed or augmented. It should be instituted only after the probable restoration of any special dissolution of continuity in the bones, muscles or tendons.

Massage is of value at any and all times, provided it is used in a manner that will produce anabolic and not destructive metamorphosis. This measure is like the application of heat. It can act as a stimulant or as a destructive agent. In this instance I frequently use this illustration to impress my patients with what result I desire. "When you put your hands in hot water and keep them there for a minute or two, you notice that they become swollen and red. If you retain them in the hot water for fifteen or twenty minutes you will observe that the swelling disappears, and that the hand becomes blanched and wrinkled." Now, the first action is a stimulant to the vaso-dilators and causes a lot of new blood to come into a tissue, carrying with it the materials for regenerative processes. This is the sort of reaction one desires for massage, just enough to produce a relaxation of the bloodvessels and tissues, and a complete saturation with new blood. If congestion or inflammatory conditions are to be overcome, then we must have recourse to the secondary heat action, the one that drives away the blood from the tissue and in its emigration carries away with it the toxic products of the bacterial invasion.

A sprain is a partial dislocation, and usually is accompanied by the rupture of some of the ligamentous structures about a joint. A certain amount of swelling occurs and we find the greatest relief in absolute rest and the continuous application of heat. For the average sprain the use of adhesive plaster for immobilization will be found far superior to any other method. Even where it is necessary to use a splint, adhesive strips will permit of the maximum of retention with a minimum of apparatus, giving one constant access to the joint and allowing of sufficient space for massage.

About a year ago I reported among several unusual cases one of fracture of the carpal scaphoid that came to me for treatment. It was supposed to be a sprain. Since then I have observed and verified a second case of this condition, and a study of its symptoms and diagnosis will possibly clear up and account for numerous cases of supposed sprain of the wrist that have proven intractable to all forms of treatment, and have resulted in a permanently painful and weak hand.

All injuries of the hand and wrist in which there is no apparent deformity are dismissed as sprains, and the advice given indicates that time and patience are the two most important factors in securing a cure. Up to four years ago this condition of fracture of the carpal bones had been practically ignored or considered as a freak condition. That it is a common one is emphasized by Scudder in the last edition of his book, in which he says: "There are many cases of painful wrist, 'rheumatism' about the wrist, weak wrist and sprained wrist, that are simply unrecognized fractures of the scaphoid bone."

The points to be considered in the diagnosis of this condition are as follows:

1. There is usually no great swelling about the injury.

2. The fingers have their normal flexibility, but the active and passive motions of the wrist are limited to one-half or less of their normal arc of rotation.

3. The presence of a definite point of pain and tenderness over the scaphoid bone or tubercle.

4. The verification of the diagnosis by x-ray examination, which will show a line of fracture with or without some dislocation of fragments.

The treatment of this condition is absolute immobilization for three weeks at least. If the fragments have not united then, permanent nonunion results, which can only be remedied by the removal of the fragments, should pain or disability become such as to warrant operative procedures.

In those cases where the injury is such as to make it probable that the result will be a permanent deformity, it is best to share the responsibility in the case with a consultant, and to inform the family of the probable defect in the presence of the consultant or a disinterested witness. One should not take too many chances by relying on the gratitude of patients, and if one has considerable emergency surgery to do, he should place his probable liabilities in the hands of a reliable indemnity company.

In this instance let me discuss for a moment the question of malpractice insurance. There are two forms of policies issued, one of which is good, and the other of questionable value. One policy provides for defense, and the other kind offers tribute. The best policy is the one that guarantees to fight the other fellow to a standstill. No doctor can afford to have any case compromised, and any policy that provides for a compromise in a malpractice suit offers a reward to any man that has any kind of a questionable result following surgical treatment. The fact of having to exhaust a reserve fund of $2,500 in legal manipulations will deter the majority of complainants and cause the average lawyer to hesitate before taking a contingent fee case, with any such certain lengthy and strong opposition.

The cost of such protection is so low that no one with any possible liability can afford to assume it on his own responsibility, when it can be shouldered upon some one else at a cost not exceeding eighty-seven cents a month for $5,000.00 protection a year.

In addition to the above remarks pertinent to the question of joint injuries, I wish to report three unusual cases of joint disease.

CASE I. This was a girl whom I saw in February, 1905. When first seen by me she presented few evidences of illness. She was about 18 years old and well built. Family history was negative. Her own personal history was also negative of anything having a bearing upon the case. When brought to me in consultation she was complaining of her left ankle. She gave a history of having been under treatment for six months for rheumatism with no relief. She had been having fever at times and the foot was swollen and tender over the region of the astralagus and about the ankle. Her temperature on the first examination was two degrees above normal. Her pulse was running up to 140. The case looked suspiciously tuberculous, yet the general summary of the case contradicted such a probability. I examined the blood and found it negative. Urinalysis was also negative, although she gave a history of a severe attack of scarlet fever in childhood. Physical examination over all the rest of the body was also negative. I stopped all medication, for her stomach had endured so much that it had begun to show signs of failing. The foot was placed in a plaster cast and kept there for nearly three weeks, being removed twice to examine for any special changes. On the removal at the end of the third week distinct fluctuation could be elicited. The foot was immediately prepared and aspirated. Over an ounce of typical tubercular pus was withdrawn. Her condition improved for a short time, but then began to grow worse rapidly. She had chills and some cough. Chest examination at first showed no change, but later there was a definite area of diminished resonance and flatness over the left apex. Repeated sputum examinations were negative. The abscess cavity in the foot was injected with a ten per cent emulsion of iodoform and glycerin. Beginning with a chill and high fever several days after aspirating the abscess cavity, she rapidly grew worse. Chills and temperature to 103½ were the daily showing. Six weeks after seeing her for the first time she had developed meningeal inflammation as one of the evidences of a profound milary tubercular infection. Death occurred in six days following the onset of the meningitis.

This case shows the necessity of a more definite understanding of the differential diagnosis of rheumatic and tubercular joint conditions. I believe that this girl's life could have been spared a longer time had the proper hygienic and constitutional treatment for probable tubercular disease been instituted in the first place. For six months she had been medicated not only ineffectually, but disadvantageously. Nothing can produce glandular inefficiency of the stomach as quickly as the iodides and salicylates. I do not condemn the first physician who attended the case, for he was succeeded by several others, and when I saw the case they had been giving the girl a course of patent medicines.

The differential points to be considered in these two conditions are the following:

Rheumatism is a polyarticular affection; tuberculosis seldom or never involves more than one joint. A single painful joint in a child must always be thought of as a possible tubercular focus. Rheumatism is a febrile condition that is self-limited in its duration and one of its best remedies is six weeks' rest. Tuberculosis of bones and joints shows a temperature above normal only after a considerable time has elapsed following the onset of the disease. Some authorities deny the possibility of a fever

from other than a mixed infection. In the later stages of a tubercular infection we also have the characteristic rapid pulse which is not found in the usual rheumatic cases. Chronic rheumatic arthritis resembles a chronic tubercular arthritis, yet a chronic rheumatism seldom exhibits a rapid heart action and is a condition that is so long under the influence of climatic variations as to allow even the patient to make a correct diagnosis.

In acute rheumatism in children we usually find a heart complication, and this one sign enabled me to diagnose a case seen in consultation not long ago. The girl had been sick for two weeks, the last few days having symptoms of a tubercular meningitis. On examination I found a mitral insufficiency and a knee and elbow joint swollen and painful. The girl was having a high fever and delirium. Ice bags were applied over the cardiac region and antirheumatic remedies given. An ice bag was also applied to the head and the meningeal symptoms disappeared with the fever. The case progressed afterwards as an acute rheumatic condition, but was further complicated by a severe chorea.

It must also be remembered that tubercular pains are not dependable as to localization. The pain in tuberculosis of the hip joint is complained of as an affection of the knee. The pains in the early stages of tuberculosis of the spine are complained of as coming from the stomach. The pain in tubercular joints is a constant condition, and usually exacerbations are complained if, principally at night.

The treatment of tubercular joints can be summarized in the words of Dr. Murphy: "Tuberculosis of any part of the body, save the intestines, will heal of itself, or has that inherent tendency, provided the part is placed at rest." Immobilization is the first and most effective means to be employed. Constitutional upbuilding covers the rest of the treatment. Forced feeding, fresh air, sunshine, and a few symptomatic remedies may be judiciously used. In some of the chronic cases where abscess formation has resulted, 70 per cent. of recoveries have been reported from the injection of iodoform-glycerin emulsion. Those joints containing pus must be aspirated under the strictest aseptic precautions, and the emulsion injected in a manner that will allow of the hermetic sealing of the opening. The entrance of a mixed infection will probably defeat the purpose of any conservative measure and nothing afterwards, short of an excision, will prove of benefit. In some cases it may progress to such an extent that amputation must be resorted to.

The second case is one of true coxa vera, a condition simulating tubercular hip joint disease so much that its differentiation demands not only all the positive evidences of tuberculosis to be excluded, but also requires that a further examination be made by the x-ray, before an absolute elimination of the tuberculosis can be made.

Nicholas Senn, in the *Journal* of the American Medical Association for June, 1905, gives an exhaustive report of his observations in these cases.

The case of coxa vera that I have recently observed is in a girl eight years of age. She first noticed the pain in her hip three years ago, and for a time it was very severe, radiating down her leg to the inner side of the knee. The family considered the pains as growing pains and called them leg aches, which they supposed would disappear of their own accord. The pains lasted for several months, diminishing gradually until at the time I saw her it was only an occasional thing for her to suffer anything at all. When she walked into my office she had the typical limp of a hip joint case of tubercular origin. She gave a history of no other scrofulous evidence, but the mother said a second child of hers had died two years previously with an inflammation of the brain, which, from her description, was possibly tubercular.

Examination of the girl showed the limb adducted and the foot rotated outward. There was both an apparent shortening from a tilting of the pelvis and a real shortening of the affected limb, amounting to one-half an inch. There was, however, no tenderness or pain on motion of the hip joint. There was no tilting of the pelvis on extreme flexion of the thigh on the body. I have an x-ray picture of the case which reveals no disturbance in the head of the femur or in the acetabulum. It shows some reduction of the angle of the neck of the femur on the affected side.

The following points are the ones we must remember before deciding upon a case as tubercular: There must be not only pain and deformity, but temperature, tenderness, and other constitutional disturbances. Tuberculosis is a progressive disease frequently resulting in abscess formation. Coxa vera never produces pus. Pain and tenderness are marked features at some stage of tubercular disease, but in coxa vera the tenderness is never a prominent sign, however much pain there may be. Tuberculosis gives a usual history of slow onset, pains referred to the knee, and a disinclination of the child to run about and play as usual. Coxa vera comes on with a history of an abrupt onset of pain in the hip and knee, with shortening and rotation as an early accompaniment. In tubercular hip joint disease the deformity appears only as a late symptom.

Coxa vara is a disease of the bonegrowing period, and is usually observed before the age when the bones are fully formed or ossified. It is considered by some as a rhachitic condition; by others a juvenile form of osteomalacia. It is a condition produced by the softening of the neck of the femur, and may be accompanied by deformities in the feet amounting to flat-foot. In some cases of this disease there is a tendency to fracture on slight injuries, and several cases are on record where resection of the head of the bone was performed for supposed tubercular disease, when it was found there was a defect in the neck of the femur resulting in a fracture and displacement of the head of the bone.

General constitutional stimulation and rest with and without extension, as indicated by the rapidity and progress of the disease, cover the treatment of the case. In my case I used a similar apparatus to that used for tubercular disease to secure rest for the limb and to correct, if possible, the shortening.

CASE III. This case was one of an unusual septic condition of the knee joint, a septic cellulitis simulating a septic inflammation of the knee joint itself. I saw the case in consultation on the fourteenth day after an injury to the knee had been received, the knee having been struck against the side of a wagon wheel. No difficulty was experienced for a week after the injury, but in twenty-four hours after pain was felt the knee was swollen to twice its normal size. Antiphlogistic measures were used for a week before I was called in to see the case.

Ordering ice bags, I was able to relieve the pain within a few hours. On careful examination there were two factors that were lacking to make it positively certain that the knee joint itself was involved. One was the absence of the patella "floating," as it is termed, on the top of the effusion. The other was the position of the limb, most relief being obtained when the limb was in the extended position.

In septic infections of the knee with effusion, the knee is generally found flexed, and any attempt to straighten it is met with great pain and resistance. Also the patella lies above the cul-de-sac of the synovial membrane that separates the quadriceps tendon from the femur, and any degree of effusion floats the patella to the top.

I aspirated, inserting the needle carefully, opposite the middle of the outer side, and found pus. I followed my aspirating needle with an incision large enough to admit a pair of dressing forceps, pushed these carefully under the skin to the same position on the inner side and pulled a drainage tube carefully through over the patella. Nearly a quart of pus was removed, and the day following a second tube was inserted longitudinally downwards and forwards. In five days the inflammation had entirely subsided and in ten days I dismissed the case.

Had I in this case mistaken the situation of the pus by overlooking the deep position of the patella and attempted drainage by the insertion of drainage tubes under the patella, as is done in synovial inflammation, I would have had an infected knee joint, a stiff knee, and possibly a one-legged patient.

CASE IV. This case was one that had received treatment at our hospital for several months for rheumatism. While walking in the yard the patient's limbs suddenly gave way, and he was so weak that he had to be assisted to his room. Both knees began to swell soon after and this swelling was followed by an edematous condition of the foot and leg. A diagnosis of "white" swelling was made by the attending physician and amputation of both limbs was advised. The feet and legs finally reached a size that resembled elephantiasis. The pain had left with the onset of the acute inflammation, and ulcerations appeared on the legs and feet. The man was finally sent to the poor house, where I saw him first, and made a diagnosis of Charcot's disease, which has been verified by the subsequent course of the case. Charcot's disease is possibly one of the rarest conditions a surgeon meets. I did not see a case in three years' hospital work in Chicago. A friend of mine saw one case after eighteen months' clinical work in Berlin and Vienna.

This condition is supposed to be a trophic disturbance following syphilitic infection, or, as Charcot terms it, a chronic syphilitic arthropathy, and osteopathy. The joints involved in this condition may be the knee, elbow or hip. Generally a single joint, most often the knee, is involved. In my case both knees were involved. The ligamentous structures and surrounding muscles and tendons atrophy, and we have a joint that can be moved in all directions with equal ease. In this case the foot could be drawn up to the chest by hyper-extension, or the leg could be moved laterally at right angles with the thigh. The arch of the foot breaks down and a peculiar flat-foot condition results. The enormous swelling that affects the knee and leg at first gradually disappears, although many months or several years may elapse. At the end of four years' time my patient's limbs were nearly normal in size. Perforating ulcers of the feet and trophic ulcers of the limbs have remained. The patient has little or no use of his limbs, but by binding his legs supported by two hickory lathes he has a limited area of motion on crutches.

GASTRIC AND PYLORIC ADHESIONS.

By A. W. ABBOTT, M.D.,

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In the gastric region, ulcer and cancer of the stomach and pylorus are the surgical problems which have received the most attention of late years. Very little attention seems to have been given to gastric and pyloric adhesions. Occasional reference to the subject has appeared in various articles in our journals in the last few years, and Robson and Moynihan, in their "Surgical Treatment of the Diseases of the Stomach," have devoted an excellent chapter to the subject; but so much stress has been laid upon the more prominent diseases mentioned above, and the attention of surgeons, and especially internists, have been so persistently directed towards these conditions that the possibility of adhesions giving rise to the symptoms have been overlooked or not fully appreciated.

I shall take as my text a few illustrative cases out of the considerable number that have come under my personal observation.

CASE I. Mrs. A., age fifty-eight years. Has for some years had epigastric pain with indigestion. For the last four months she has had pain in the lower dorsal region, shoulders and breast, diarrhea alternating with constipation, vomiting of food and mucus, but no blood. Lately she has had much epigastric pain. Examination of stomach contents, which are difficult to obtain by the stomach tube, shows the presence of hydrochloric acid; lactic acid absent. Test meal undigested after one and a half hours. Patient very weak and feeble. Pains are more marked upon standing or walking—some relief on lying down. No history of a perforating gastric ulcer.

Physical Examination: Opposite about the costal cartilages of the eighth and ninth ribs there is a hard sensitive tumor apparently about two inches in diameter, and evidently attached to the anterior abdominal wall at or just under the cartilage.

The stomach is contracted rather than dilated, only holding about one pint of fluid. On making an exploratory incision, a hard thickening, the result of an old ulcer, at the lesser curvature of the stomach could be felt, which seemed to project about half way down in the lumen of the stomach. Upon the left side in front of the greater curvature, about two inches from the esophageal end of the stomach, there was a very firm band of adhesions nearly an inch in circumference, about one-fourth inch long, holding the stomach firmly against the anterior abdominal wall. An incision was made in the anterior wall of the stomach and an ulcerated area, easily bleeding, was found at the apex of the hard mass projecting into the stomach. This thickening practically gave to the shape of the inside of the stomach that of an hour glass contraction. It did not appear to be malignant. The incision into the stomach was closed, the adhesions to the anterior abdominal wall entirely separated and the serous surface drawn over it on the stomach side. The woman made a remarkable recovery, is free from all gastric pain, digestion is perfect and has gained about fifteen pounds in two months. The operation was done about a year ago, and when lately heard from she was still in excellent health.

CASE II. Mrs. W., age twenty-nine, mother of four children. Bowels constipated, appetite poor, frequently vomits her food. Has a constant severe epigastric pain, which is relieved somewhat by the recumbent position. Has vomited no blood. Hydrochloric acid present, lactic acid absent. Stomach dilated to two inches below the umbilicus.

Physical Examination: Tenderness in the epigastrium; no discoverable tumor. Dr. J. W. Bell, who had treated the case, while he did not feel sure that there was an ulcer present, advised exploration. This was done, and the only abnormalities found were a number of strong fibrillary bands extending from about the pyloric end of the duodenum to the quadrate lobe of the liver. The adhesions were thoroughly separated; a posterior gastroenterostomy was also done in this case. The woman has made a rapid recovery, and is entirely free from epigastric pain. Whether the gastroenterostomy has had much to do with her recovery is a question. I believe that the good results are due more to the release of the adhesions which held the pyloric end of the duodenum in a fixed position, and so interfered with its motility, than to the gastroenterostomy.

CASE III. Mrs. K., age twenty-two, no children. Bowels obstinately constitpated; has a variable appetite; severe epigastric pain for three years. The pain is sometimes worse after eating. Patient has never vomited blood. Pain extends to the back and especially to the left shoulder.

Physical Examination: Very marked dilatation of the stomach; absence of motility; presence of hydrochloric acid, absence of lactic acid; no tumor. On exploration the pylorus is found normal, no evidence of ulcer, no adhesions about the pylorus. On attempting to lift the stomach a broad adhesion of the shortened and thickened omentum was found attached to the left pelvis passing over the sigmoid. The adhesion was so firm and tense that, by the tension imparted to the gastrocolic omentum, the lower part of the greater curvature of the stomach was held in a fixed position; indeed, it was drawn out into a cone. This adhesion was separated, gastroenterostomy made, with great relief of symptoms. This operation was done about two years ago. The improvement continued up to about three months ago, since when some of the same symptoms have reappeared, but for what reason is unknown, as the patient has since been lost sight of. It is evident that the gastroenterostomy alone would not have relieved the pain.

CASE IV. Mr. N., age thirty-two. Has had epigastric pain for thirteen years, with tenderness on

moderate pressure. This pain was very markedly increased by exercise or the upright position, and relieved by lying down. Had no nausea or vomiting, in fact, no disease referable to the stomach itself, except the pain. Positively no history of peritonitis. His appetite was good; had no loss of flesh.

Physical Examination: He had a small hernia just above the navel, which however was shallow. There had never been any strangulation. The epigastric pain was very much increased by pressure over a point a little to the left of the median line. On making an exploration, one very small band of adhesions extended from the duodenum about three inches below the pylorus to the quadrate lobe of the liver. This, however, was not tense. Upon lifting the liver and pressing the stomach downward, it was found that the gastrohepatic ligament was very much shortened and thick, keeping the lesser curvature of the stomach in a fixed position, and on a plane anterior to the normal. The adhesions to the liver were separated as well as possible, and the incision with the hernia closed. Before the operation, I was of the opinion that the hernia had probably a great deal to do with the pain, but in view of the dense gastrohepatic adhesions and the shallowness of the hernia, I believe that the adhesions were the principal offenders. It is questionable as to how much permanent benefit this patient will gain from the operation. He is still free from pain, six weeks after operation, but I am afraid that the adhesions will reform.

CASE V. Mrs. K., age thirty-two, no children. Constant cramps in the region of the gall-bladder, with pain radiating to both shoulders, bowels constipated, fair appetite, no vomiting, but some pain and gaseous distention after eating. No epigastric pain, but tenderness extending to the gall-bladder region when the epigastrium is pressed upon. The pain is pretty nearly constant, but always worse in the erect position or after working. No jaundice.

Physical Examination: No tumor was found, but pressure anywhere in the neighborhood of the gall-bladder, especially towards the median line, would bring on cramp-like pains. No distention of the stomach; the stomach contents normal.

In making the incision over the gall-bladder, extensive and pretty firm adhesions were found between the gall-bladder and the adjacent portion of the liver, thence extending over to the duodenum. These were separated. No other operation was made on the stomach. Gall-bladder normal. The patient has been entirely relieved of the pain and has gained in weight. Lately some similar pains have developed upon the left side, the nature of which have not been determined.

CASE VI. Dr. R., age thirty-six. Four years ago had a first attack of gall-bladder colic, pains extending to the shoulder. No jaundice, no vomiting, no fever. The peculiar symptom connected with this case was that the colic was always preceded by attacks of indigestion with epigastric pain. On incision a very much inflamed gall-bladder, containing gall-stones was found. But a very interesting feature consisted in the very extensive adhesions extending from all about the gall-bladder onto the liver, to the duodenum as well as to the colon. It is highly probable that the adhesions precipitated the attacks of indigestion, and at the same time provoked the gall-stone colic by the traction upon the gall-bladder, as the cystic duct was open and the stones were in the upper part of the gall-bladder.

The above cases are cited as illustrations of the importance of adhesions and of the frequency with which they are found if sought for, in stomach cases. Robson states that adhesions are found around the stomach; about forty per cent. of all cases of ulcer of the stomach are associated with adhesions; that pyloric adhesions are very much more common than is usually supposed, and that their importance is greater than is generally recognized even at the time of the operation. He also cites a case of a fatal acute dilatation of the stomach due solely to pyloric adhesions. This is the point which I wish to make emphatic and for which this paper is written, viz.: that in making our diagnosis of gastric and associated diseases, and even in operations upon the stomach itself, for ulcer or other cause, we are very likely to overlook the adhesions which may be the principal cause of the symptoms. In other words, the epigastric pain, tenderness, nausea, vomiting and dilatation of the stomach may all be due to adhesions; and by influencing the mobility of the stomach and its free evacuation, that adhesions may cause the pain even when the ulcer of the stomach is present, and that pain-causing adhesions may be present even when there has never been any previous history of stomach diseases or any recollection of any local or general peritonitis.

It is not within the scope of this paper to go into the causes of these adhesions. It will suffice to say that they seem to be divided into two distinct kinds. *First*, those which are very firm and short, and which seem to originate in the immediate vicinity of ulceration or malignant or tubercular disease of the stomach; the other kind being fibrillary in character, not so dense and evidently the result of a more acute process and usually of a general peritonitis. The symptoms of adhesions about the stomach and pylorus may be exactly like those typical of ulcer of these organs. On the other hand, only one or two symptoms, especially pain, may be present. One very important symptom which has been mentioned by Merklen and present in most of my cases is the increase of pain and tenderness after exertion or standing, and due evidently to the traction made by the adhesions.

Robson states that when the adhesions are pyloric

and the stomach is distended with gas the cavity of the stomach will be found to extend further to the right and higher than normal. The character and location of the pain are of course influenced by the extent, firmness and position of the adhesions. In our cases constipation seems to have been pretty constantly present. In one case, Mrs. A., the constipation alternated with diarrhea.

From the nature of this pathological condition, it will be seen that medication is likely to afford very little improvement and that radical cure is not to be expected from drugs or from a special diet. When, therefore, cases present themselves with symptoms akin to those of ulceration of the stomach, and which do not yield to proper treatment, the patient should not be allowed to suffer, with a diagnosis of nervous dyspepsia. An exploration should be made and adhesions sought for whether ulcer is found or not. If ulcer is found, it also can be appropriately treated. As Robson says: "It may be asked what is the use of detaching adhesions as adhesions are likely to form again?" The question has some theoretical basis, but practically we find that, if these adhesions are separated, and especially in the cases of pyloric and gastric adhesions, if the patients are placed in a nearly upright position, immediately after the operation, they recover in a large majority of cases, whether the adhesions form again or not. It is not by any means nceessary to accept the idea that adhesions do not reform in all cases, but if they do, it is to be presumed that they are less firm and perhaps sufficiently long not to interfere with the function of the organs to which they are attached."

In conclusion, I wish to call your attention to the fact that adhesions about the stomach and pylorus may produce the principal symptoms of which the patient complains. That many cases of so-called nervous and hysterical dyspepsia are due to adhesions about the stomach and pylorus, and that in all cases where an operation is done for ulcer, pyloric obstruction or gall-bladder disease that the operation should be considered incomplete unless a thorough exploration for adhesions has been made and these adhesions corrected as far as possible.

RUPTURE OF THE KIDNEY.

Clinically, it is evident that the vast majority of injured kidneys result from force expended directly through the lumbar region, so that a laceration of this organ is not often accompanied by complicating injuries to the intraperitoneal structures.—OTTO C. GAUB in the *Pennsylvania Medical Journal.*

RADICAL CURE OF INGUINAL HERNIA.*

BY A. R. ALLEN, M.D.,
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Hernia is probably the most common disability that affects mankind. It has been the odium of surgery for centuries, and only within the last score of years has the profession been in position to say to those afflicted that they can be cured. Thanks to Bassini, an Italian surgeon, the key to the anatomical difficulties was found, and since the principles of his operation have been made known to the profession, who have awakened to its value, it is now in use the world over, with various modifications.

Probably 10 per cent. of the population suffers from hernia in its various forms. The most elaborate statistics are those of Malgaigne in which he states that in males of the age of

21—1 in 32 is affected.
28—1 in 21 is affected.
35—1 in 17 is affected.
40—1 in 9 is affected.
50—1 in 6 is affected.
60 to 70—1 in 4 is affected.

As the heaviest and most arduous duties of life fall, and properly so, on the male sex, we can readily realize the effect it has on the earning capacity of the individuals affected. It necessarily reduces his producing or earning capacity from 5 per cent. to 50 per cent., depending upon the form, extent and variety of the hernia suffered from. When we come to compute the aggregate financial loss to the state and nation from this cause, it is simply stupendous and almost inconceivable, without taking into consideration the sufferings and discomforts of the patient, and the attendant dangers to life from strangulation, which is a real and an ever present evil.

Prior to Bassini's method for the cure of hernia, the percentage of cures from radical operations was not over 45 per cent., and where the operation was not a success, the patient was worse off than before: naturally, then, only cases of strangulated hernia came to operation, and these had a high mortality on account of the delay and long-continued efforts at taxis previous to the operation.

One should keep in mind the uncertainties attending the wearing of a truss; the constant annoyance caused by its presence; the many improperly fitted; the aggravating pressure, and the real danger of the hernia slipping from under the pad and becoming strangulated (and this is certain to happen sooner

* Read before the Cumberland Valley Medical Association, Sept., 1907.

or later to the constant truss wearer and especially to those engaged in an active life), and the fact that the hernia grows larger as age comes on and is harder to retain. These facts in connection with the lessened earning power of the individual, present, so long as the patient is a truss wearer, should be carefully laid before the individual, and the advantages to be derived from a radical cure, as well as the attendant dangers arising from the operation, which are small, should also be taken carefully into consideration.

We can state absolutely that in selected cases, the mortality is practically nil. Coley in his article in the *Annals of Surgery*, Vol. 37, page 802, reporting 1,075 cases, states that his mortality was 1/5 per cent.; the Vienna Clinic reports 804 cases with 3/5 per cent. mortality; Johns Hopkins Hospital reports 459 cases with 1/5 per cent., and Carles Clinic reports 1,285 cases with 1 death, a mortality of 1/13 per cent. It shows that the risks are practically nil and are certainly much less than the risks of strangulation, even with a hernia apparently well held with a truss. Referring again to Coley's statistics, as to the percentage of cures, in this same article he states that he had 1 per cent. of relapses—of these relapses 85 per cent. occurred within the first year, 65 per cent. within the first six months, 13 2/3 per cent. from one to two years after operation and that after two years a permanent cure may be expected. With such a small mortality and infrequent relapses, we can confront our patients with arguments that are unanswerable, and conscientiously and honestly urge upon them the operation for the radical cure of their disability, assuring them that the operation is much less dangerous than wearing a truss, and that the only thing to do, is to accept operation and be cured. I believe we as a profession have not taken sufficient notice of the surgical progress in this disability or have not become acquainted with it, else we would be more up to date in the matter and call the attention of these sufferers to the advantage of the operation for the radical cure.

We all know the dangers that result from delay and from taxis in strangulated cases, such as gangrene, rupture of the bowels, etc. Yet many persist in using taxis for hours at a time, give up, let the patient rest, and renew their efforts, finally consenting to the operation only to find a gangrenous condition within the sac, the operation being done too late.

There is no reason why any patient should die from a strangulated hernia to-day. If he does, it is the fault of the attendant in delaying the operation too long and using useless endeavors to reduce the bowel by long-continued taxis. If a hernia does not show signs of retiring after ten minutes' effort, under anesthesia, operation should be done at once. One should never let a strangulated hernia go beyond the twenty-four hour period and for an inguinal and for a ventral or femoral hernia twelve hours is often too long. Sufferers who delay calling in assistance in these cases must bear the responsibility for delay themselves. There is no reason why anyone should allow this condition to occur, except when the hernia and strangulation occur simultaneously and they are beyond the reach of assistance. The presence of a hernia in anyone over four years old is an indication for the radical operation.

Bull and Coley's indications for operation, as taken from Coley's artcle in *Annals of Surgery*, Vol. 37, page 802, are:

In children, operation is seldom advised under the age of four, except in strangulated cases. Many of these cases can be cured by the use of the truss. After four years, in all cases where a truss has failed or in cases in which the presence of a reducible hydrocele prevents a truss from holding the rupture, operation is advised.

In Adults. In all cases under the age of fifty, unless there is a strong contra-indication, operation is advised. Between the ages of fifty and seventy years operation is advised in patients in good health, and in cases in which the rupture is held with difficulty by a truss.

Contra-indications. (1) Serious organic trouble of the heart, lungs or kidney; (2) a very large, adherent, irreducible hernia, in a stout individual, especially when the sac contains both intestine and omentum. The risk of operation in such cases are large and chances of a permanent cure small. When omentum alone is present the danger is less.

Operation.. *"A straight oblique incision is made, beginning at the inner side of the anterior superior spine and ½ inch internal to parallel with Poupart's ligament, and ending over the center of the external ring. This incision is about 3-3½ inches long in adults, and 2½-3 inches in children. The aponeurosis of the external oblique having been clearly exposed, a director is passed in at the external ring beneath the aponeurosis for a distance of about 2½ inches. The aponeurosis is then slit up with a scalpel, great care being taken not to cut any underlying muscular fibers. The aponeurosis is thereupon dissected back on the inner side nearly

* The description of the Bassini operation in this article is taken *verbatim* from the INTERNATIONAL TEXT-BOOK OF SURGERY. 1st edition, as it is the most concise and clear description of the operation I have read.

to the edge of the rectus muscle, and on the outer side until the shelving process of Poupart's ligament is well exposed. The soft tissues on a level with the external ring or slightly within it are then grasped with a pair of thumb-forceps, and the muscular fibers pushed aside by means of a pair of blunt-pointed curved scissors. The white tissues of the sac are thus quickly exposed, and held by a pair of artery-clamps. The sac and cord are then easily and quickly separated from the overlying tissues, without hemorrhage, with the thumb and forefinger. In oblique hernia the cord will always be found posterior to the sac, closely enveloped in a thin layer of fascia—the infundibuliform fascia. This layer of fascia is best separated by means of the thumb and forefinger, and the sac is easily isolated from the cord. Dissection is carried high up until the sac begins to widen out to form the general parietal peritoneum. At this point it is closed by catgut ligature, if small in size; if large, it is sutured and the lower portion excised. When tied off, the sac should always be transfixed, to prevent slipping of the ligature. If the sac be congenital, just enough of the lower portion to cover the testicle is allowed to remain, this being closed by continuous catgut suture. The internal oblique muscle should never be cut; in fact, no tissues beneath the aponeurosis are cut. If cut, the edges retract and can never be accurately adjusted or thoroughly united. Cutting of the internal oblique is entirely unnecessary, as gentle stretching with the fingers is sufficient to open the canal to the desired extent. The cord is then held up and out of the field of operation by means of a strip of iodoformized gauze. Next, the deep sutures are introduced by a curved needle. The first suture enters the internal oblique muscle nearly as far as the outer edge of the rectus muscle, and should just touch the cord when the latter is held vertically to the plane of the abdomen. The suture passes outward through the shelving portion of Poupart's ligament, and is then tied. Three or four similar sutures complete the closure of the canal as far as the symphysis pubis. The lowermost suture includes the conjoined tendon. A suture passing through the same structures is—Coley's stitch—then placed just above the cord. This is not strictly a part of Bassini's technic, but has been added by the writers—Coley and Bull—and undoubtedly strengthens the canal at its weakest portion—the internal ring. The cut in the aponeurosis is next closed by means of an interrupted suture, the cord lying directly beneath this layer. Care should be taken to leave sufficient room at the lower end to permit the cord to pass out without undue constriction. The skin wound is then closed without drainage, by means of interrupted sutures of fine catgut or silk-worm gut.

It should be stated that Bassini himself, in his original paper, advocated silk for the buried sutures, but since 1892 he has employed chromicized catgut.

FEMORAL HERNIA: A PLEA FOR EARLY RADICAL OPERATION.

By Ralph Elmergreen, M.D.,
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In the discussion of any form of hernia, it is always wise to review briefly the gross anatomy and general surgical and anatomical relations of the parts and structures we necessarily must refer to in the course of our essay. No matter how long we may ponder over our treatises on anatomy, and quite regardless of the time we may spend in dissections on the cadaver, or operations on the living, to the surgeon there is always something new and interesting about the anatomy of the groin, and the technic involved in operations in this region. It is this thought I kept in view in preparing this paper, and so I offer no apologies for reviewing anatomical structures, often learned and as often forgotten by some of us, and for emphasizing surgical truisms, daily parroted in the abstract, yet as often overlooked and neglected by us in our practical work.

Anatomy.

Poupart's ligament divides the groin into an inguinal region and a femoral region. I shall confine my attention in this paper wholly to the femoral groin—to Scarpa's triangle. I shall even limit myself to the upper portion of this region, by assisting you in drawing a figure within Scarpa's triangle, sharing Poupart's ligament as a common base, but taking the pectineal muscle on the inside, and the ilio-psoas muscle on the outside, as the other two sides of it.

Disregarding for the present the skin, superficial vessels, nerves, glands, etc., you will notice that we have a space somewhat collapsed in the normal condition—oval, transverse in direction, less than one-half inch long, lying between the fibrous septum of the femoral vein on the outside, and a reflection of Poupart's ligament known as Gimbernat's ligament, on the inside. Above and anteriorly to this space we have Poupart's ligament, while posteriorly, we have the pubic bone, pectineus, and pubic portion of the fascia lata. This space is known as the femoral ring, and corresponds with the internal ring in inguinal hernia. The ring is

covered with a thin, non-resisting, areolar tissue, known as the septum crurale, which is reflected from the femoral sheath. Not infrequently a small lymph gland, known as Rosenmueller's gland, is lodged in this space. The femoral ring is an inherent weak point in our anatomy. The edges of this ring, especially the external borders of Gimbernat's ligament, are sharp and offer great resistance. In many cases of strangulation the semicircular edge of this little ligament is at fault, and for relief it should be cut upwards and inwards to avoid injury to the important vessels. A little lower down, about one-half an inch, and slanting in an inward direction, we find another opening, also oval in shape, formed by the iliac and pubic portions of the fascia lata. This space is known as the saphenous opening, admitting the internal saphenous vein. This opening is also more or less collapsed in the normal state, and is covered by a thin, areolar fascia known as the cribriform fascia. The saphenous opening permits the external escape of a femoral hernia, and corresponds to the external ring in inguinal hernia. In some cases of strangulation we find the point of constriction at this outer opening, owing to the dense and rigid falciform process of the fascia lata that guards the outer border of this opening. The space between the femoral ring and the saphenous opening is known as the femoral canal, corresponding with the inguinal canal in inguinal hernia. This canal is in a complete state of collapse, if not wholly non-existing in the normal person. It is about one-half an inch in length, and occupies, only when there is separation, the inner compartment of the sheath of the femoral vessels.

We thus notice, that passing from within outwards, we meet with the following coverings: (a) Within the abdomen, peritoneum; subserous areolar tissue. (b) At ring, the septum crurale. (c) In femoral canal, femoral sheath. (d) At saphenous opening, cribriform fascia. (e) On thigh, superficial fascia and skin.

STATISTICS.

When we review the anatomy of femoral hernia, it becomes quite apparent that man has not yet adapted himself to the upright position, and that the only surprise is that femoral hernia is not even more common than it really is. There is nothing to hold the abdominal contents back but easily yielding structures—skin, fascia and flimsy, sieve-like areolar tissue, nothing more. Yet, in the face of these glaring anatomical defects, and the periodical increase in abdominal pressure brought about by coughing, and heavy lifting, only about three per cent. in the male of all hernias are femoral. The percentage in the female is about twice as large. According to Macready, even in the female, inguinal hernia is more frequent than femoral hernia. Sifton, however, believes that in the female femoral hernia is about three times as frequent as inguinal hernia. He finds but little support here. In the statistics of the London Truss Association, Macready gives the relative frequency of femoral hernia as compared with inguinal hernia as 1 to 16. Coley gives this proportion as 1 to 17. Of 15,028 operations for hernia that Pott collected from hospitals all over, he found 933 femoral, and 14,092 inguinal, about the same proportion as Coley. When we look at these figures and then think of the patients we have known as martyrs to a long truss-wearing life, it is small wonder that with the advent of aseptic surgery, our leading surgeons here and abroad began to think of means and methods of restoring the normal resistance to the weakened and defective parts of the abdominal wall.

Hernia has for years not only been a medical topic, but also an economic topic. The ruptured man or woman is, as an industrial factor, seriously handicapped. The man with a hernia is disqualified for both army and navy service. Many transportation companies and not a few industrial concerns refuse to employ a man suffering from hernia. Add to this the annoyance and the discomforts of truss-wearing, and the ever-present danger from strangulation, and you will readily see that any operation that would permanently do away with the truss and restore the unfortunate man or woman to a perfect physical condition is indeed an economic and surgical Godsend.

To-day the percentage of permanent cures for femoral hernia is nearly, if not quite, as high as is the percentage of permanent cures for inguinal hernia.

If we do away with the complicated methods of Gordon, Kammerer, Baldwin, von Bergmann, and even Kocher, all only of signal benefit in skilled hands, and thoroughly familiarize ourselves with the simple and equally successful Bassini method, or the pursestring method, or even the Ochsner method—if we do this, nearly all our cures will be permanent, with a mortality kept down to *nil*. To my mind, it is as culpable for the surgeon to counsel on the side of palliative measures in a case of femoral hernia, and wait for strangulation before operation, as it would be for him to say, I will take the appendix out should you ever get another attack. Operate on all cases of femoral hernia as soon as the diagnosis is made, unless there are contraindications. If the patient refuses, the responsibility

rests on his, not your shoulders. It is better that you take the man away from his business and put him on his back for a few weeks, again sending him into the world as a whole man, than that you should subject him to the discomforts of a nasty truss, and the dangers of a momentary strangulation. It is safer to take the woman out of the kitchen and put her in her bed for a few weeks, and then send her home whole and wholesome, than to subject her to the annoyance of the hideous truss, or the momentary danger of constriction and bowel incarceration.

ETIOLOGY.

Ochsner tells us that more than one-third of all patients suffering from hernia give a history of heredity tendencies in this direction. This is particularly true of femoral hernia in women. I have in mind a family in which the mother and both her mature daughters suffer with a small reducible femoral hernia, all wearing retaining pads, and all refusing an operation. We have all noticed a tendency toward the under-development of the deltoid, the biceps, or the rectus muscles in some families, just as we see in other families a poor development of the tissues surrounding the femoral canal, leaving the openings wide and patulous. The wide pelvis unquestionably predisposes some women, and not a few men, to femoral hernia. The anatomist tells us that the space between Gimbernat's ligament and the femoral sheath of the vein is always proportionately large in wide pelves. This perhaps explains the greater frequency of femoral hernia in women, especially when we take this anatomical fact in connection with the comparatively greater exposure of women to the exciting causes that increase the intraabdominal pressure. The deposit of large quantities of fat both in the abdomen and externally around the hernial aperture predisposes toward hernia. When the fat is deposited around the viscera, it adds to the abdominal pressure, and when it is deposited around the ring and canal, it weakens the integrity of the normal tissues. Violent coughing, the lifting of heavy weights, and chronic inflammatory processes, all are factors that should be considered in connection with the exciting causes of femoral hernia.

DIAGNOSIS.

The differential diagnosis of hernia is not always easy. Fatty tumors in the femoral region have been mistaken for hernial protrusions. The same is true of sarcoma, and even enlarged lymphatic glands have worried not a few practitioners. When the omentum becomes adherent to the ring or the canal, as a result of acute inflammatory processes, the diagnosis is still more difficult at times. In rare cases the femoral sac cannot force the cribriform fascia at the saphenous opening downward, and the tumor, following the course of least resistance, will turn upward and appear above Poupart's ligament, thus closely resembling an inguinal hernia. In other cases the femoral tumor may pierce Gimbernat's ligament and closely hug the pubic bone. Blake reports a case in which the femoral sac actually forced its way underneath the femoral sheath, throwing the femoral vessels forward and outward. In short, femoral hernia is one of the tributes man pays to the law of gravitation for the privilege of assuming an upright position. The femoral protrusion will always follow the line of least resistance, which, in the great majority of cases, is along the femoral canal, emerging at the saphenous opening. When a femoral hernia is not strangulated, there is always on impulse on coughing. The tumor is usually small, and freely movable and can be pushed to the outside of the spine of the pubis. The hernial tumor, however, cannot be moved very freely when the contents of the sac have become adherent in any part of the femoral canal as the result of continued pressure from a truss, or some inflammatory process following trauma or infection. Varix of the femoral vein in fat people may be hard to differentiate from femoral hernia, in rare instances. The same may be said of cysts and hydrocele. However, patience and a trained tactile sense will generally enable the surgeon to arrive at a correct diagnosis.

CLINICAL TYPES.

Clinically, we may very properly classify femoral hernia into (a) reducible; (b) irreducible; and (c) strangulated hernia.

Reducible femoral hernia is often overlooked. The symptoms complained of are fleeting and indefinite, and physicians very often neglect to make a proper examination of the groin.

Irreducible femoral hernia is generally a great discomfort to the patient. Adhesions frequently form as the result of infection, prolonged massage, or trauma, and the tumor becomes tender and painful. The differential diagnosis in these cases is sometimes beset with many difficulties. Early operation for a radical cure is the only treatment. The truss and all attempts at taxis can only do harm in these cases.

A femoral hernia becomes strangulated very easily, owing to the dense and sharp internal edge of Gimbernat's ligament, and the prehensile clutch of the falciform process that guards the saphenous opening. Bassini took a plaster cast of the femoral canal, and found that the narrowest point was oppo-

site the sharp falciform process. Immediate operation is always imperative in strangulated femoral hernia, as gangrene of the intestinal loop or strip of omentum will often set in within a few hours after constriction has taken place.

SYMPTOMS.

The symptoms of strangulated hernia, besides the tumor peculiar to a femoral hernia, are abdominal pain, tenderness, and early tympanites. In older people, however, these symptoms are often delayed and are not as severe as in younger people. This, perhaps, is due to the lessened blood pressure in elderly people. The development of gangrene in old people suffering with strangulated hernia, as a rule, comes on later than in young people. The colicky pain is generally the first symptom, tenderness, tympanites, and complete bowel obstruction supervening within a few hours. Vomiting, too, is an early symptom. The contents of the stomach are first thrown up, which is soon followed by gastric mucus and bile. Towards the end the characteristic stercoraceous vomiting sets in. The temperature, owing to the shock, is often below normal. With the coming on of toxemia from systemic absorption, the temperature will rise proportionately, becoming again subnormal with the first symptoms of collapse. The pulse-rate is a fairly reliable index to the condition of the patient. It becomes irregular and thready toward the end. Accompanying this pulse there is the ashen, drawn facial expression known as the Hippocratic face. The impaired mental condition is reflected by the patient's repeated statements of feeling well, and his determination not to be removed to the hospital for immediate operation. It is in these cases and at such critical moments that the strong will of the attending surgeon should and must prevail. And I wish to go on record right here with an expression of contempt and denunciation for the incompetent and conscienceless practitioner, called in clandestinely by the family, or a relative of the family, at such a crisis, who, instead of confirming the diagnosis and urging immediate operation, robs the defenseless patient of his fighting chance by again attempting taxis and counseling delay.

GENERAL TREATMENT.

Femoral hernia is always acquired and so rarely found in very young children. In older children a well-fitted truss will sometimes assist the natural agencies in effecting a permanent cure. The chance of a cure is perhaps increased by a good nutritious diet, and suitable physical exercise. In the vast majority of cases no improvement takes place through such palliative measures, and it is here where the surgeon should step in and urge the early radical operation unless there be special contraindications. The mortality of the radical operation is practically *nil*, and the permanency of cure if properly performed is close to 100 per cent. Massage, physical culture, the injection method, and the open method with a view of replacing normal structures by scar tissue, I shall only mention here to condemn. They are all unsurgical and unprofessional, and are on a par with the olive oil treatment for gall-stones and the medical treatment for appendicitis. If a truss is fitted as a temporary palliative measure, care should be taken not to compress the femoral vein. In strangulated femoral hernia taxis should be attempted with great caution. The thigh should always be flexed and turned inward. Taxis should not be attempted after six hours of strangulation, nor should any immediate degree of force be applied, or any attempt at taxis be prolonged beyond a few minutes at a time. If ether is administered, preparation for the radical operation should always be made while the patient is put to sleep. If gentle taxis under full anesthesia fails, operate at once, making it a radical operation if the environments and the condition of the patient permit it.

The rules laid down by textbooks with reference to the axes of pressure in using taxis are of little value, and may often be disregarded with profit to the surgeon, and with a decided advantage to the patient. The anatomical relations of structures are by no means always clean-cut in strangulated femoral hernia, as when inflammation has set in with the concomitant formation of gases and exudition of septic fluid, all surgical landmarks are often destroyed. In such cases I have found it expedient to steady the neck of the tumor, as Levings suggests, and then make uniform pressure on the hernial mass in the hope of forcing the gases back into the abdominal intestines. This procedure will in not a few cases reduce the tumor in size, collapse it, as it were, and permit it to slip away from the fingers into the abdominal cavity.

RADICAL OPERATION.

Until a comparatitvely few years ago, it was thought that the radical operation to effect a permanent cure in femoral hernia was not as satisfactory as this operation had proven in inguinal hernia. This view was held by many surgeons on account of the anatomical relations of the femoral vein, forming, as it does, the outer border of the canal, which prevents the passing of sutures on that side. These views, however, have been completely upset by the data collected by Pott, Coley, and others.

Berger had no relapses in 25 consecutive cases; Coley had but one relapse in 36 cases, due to infec-

tion. Later, Coley reported 40 cases without a relapse. Bassini examined 41 cases, two to nine years after operation, and found no recurrences. De Garmo reported 110 operations for femoral hernia, with only one failure. Von Bergmann, Lotheissen, Kocher, Gordon, Bacon and Kammerer, all report groups of cases that warrant the conclusion that the permanency of cure in femoral hernia is most satisfactory. I should add, however, that some of the above surgeons find fault with the ordinary Bassini method, the pursestring method, or modified operations of Jobse and Mayo, and have adopted the more complicated methods of Berger, or modifications of the same.

TECHNIC.

The pubic region should be shaved and properly prepared. The patient is placed in the normal recumbent position, the surgeon standing on the side of the hernia. Make an incision about two inches long, parallel with Poupart's ligament. Let the middle of the incision pass over the highest point of the tumor, regardless of neck or canal. Cut through the skin and superficial fascia only. Apply artery forceps and retract wound. Pick up and divide every successive layer cautiously, as the hernial sac in old atrophied cases sometimes lies right next to the skin. The sac can be easily recognized by its smooth, hard structure; but when irritated by a truss, or engorged by strangulation, it may be very difficult to differentiate the structures, and in that event it is always wise to open the sac before beginning dissections in order to make sure of its identity. When the sac is opened, there is usually an escape of hernial fluid. Dissect the sac from its canal by blunt dissection. Free it from the femoral ring, and pull it out freely. Reduce the bowel, if viable, and in good condition. Always ligate and remove the protruding slips of omentum, whether adherent or not. Do not cut the femoral ring unless necessary, in order to reduce the bowel or omental stump. If the loop of intestine looks suspicious, lay the canal freely open and bring the loop to the surface, covering it with warm towels. Should normal circulation fail to return within a few minutes, or should you detect any necrotic patches in the intestinal walls, resect, and make an end to end anastomosis. If the condition of the patient does not warrant this delay, make a temporary anus and finish the operation at a later day. Pull down and transfix the sac in all cases, ligating it with strong thirty-day chromic catgut. Tie securely, and cut off the distal part, leaving a good stump brought back into the abdomen. When the bowel is returned into the abdomen in good shape, either with or without resection, as the indications warrant, the surgeon should give his attention to the proper repair of the ring and canal.

I should, perhaps, mention before going on that whenever there is any question about the viability of the strangulated loop of bowel, give the patient the benefit of this doubt by resection, as the smallest necrotic patches are always virulently septic and destructive of life. Hesselbach and his followers do not resect the bowel through the primary incision, but make an incision above Paupart's ligament, like the Kammerer incision along the outer border of the rectus muscle, and deliver and resect the bowel through this higher incision. The advantage of this procedure is the time gained, the surgeon being enabled to repair the femoral canal while awaiting return of life to the doubtful intestinal loop.

REPAIR OF CANAL.

Ochsner, following Berney, simply denudes the edge of the ring, claiming that if the parts are not distorted by sutures, the opening would fill up within a few days. He reasons along the well-known surgical principle that all openings in normal tissue except those lined with mucous membrane, will readily close up if left alone, and the anatomical relations are not distorted. Ochsner, though very successful in his hernial work, yet, of late, hesitates in forcing his views.

Bassini, working on the theory that Poupart's ligament and the fascia lata are relaxed in femoral hernia, brings these two structures together by seven sutures. Bassini rarely has a recurrence. Kocher, Fabricus, and Gersung use complicated methods which necessitate the opening of the inguinal canal, and thereby invite an inguinal hernia. Salzer covers the ring with a pectineal flap, while Schwarz uses a heteroplastic flap for the same purpose. A few surgeons have made use of the osteoplastic flap taken from the pubic bone; while some surgeons whose names I cannot recall, have advocated the use of decalcified bone and other foreign material—all, however, with only indifferent success. Von Bergmann for some years maintained that the simple closing of the femoral ring was not good surgery. Bacon and Kammerer, and also Heidenthaler, and Lotheissen, have at times given expression to the same criticism. Such criticism, however correct in theory, must yield to the wonderful success that Coley and his many followers have had with the simple suturing method.

My personal experience is confined to the Bassini and pursestring methods, and, while limited in material, yet it covers a period of ten years, giving me ample opportunity to keep in touch with my cases

and profit by experience and improved technic. I use nothing but thirty-day chromicized catgut for suture material. I dispose of the sac by transfixion and high ligation, dropping the stump back within the abdomen. I denude the edges of the ring, and slightly free and denude the lower margin of Poupart's ligament. Then I carry a Hagedorn needle, threaded with a catgut suture, through the free portion of Poupart's ligament to the pectineal fascia below, hugging the pubic bone. I run three or four parallel sutures to the first one, the last two sutures going through only the falciform process of the fascia lata, instead of through Poupart's ligament, so as not to distort the anatomical position of the distal portion of the ligament. These sutures, when properly tightened, bring the anterior and posterior walls of the femoral canal in close approximation, and join Poupart's ligament with the pectineal line. In a few cases I have used the pursestring suture in closing the ring. This suture practically takes in the same structures in one loop that the seven Bassini sutures take in, and therefore needs no further description here. I secured primary union in all my cases, and leaving out one case of strangulation with gangrenous bowel that died a few hours after operation, I am pleased to report that I have had no recurrences in any of my cases, so far as I am able to ascertain.

To recapitulate:

1. Operate on all cases of hernia, unless there are special contraindications. Do not subject the poor patient to a truss-wearing martyrdom in these days of aseptic surgery, when you can hold out to the unfortunate man or woman a mortality practically *nil*, and a permanency of cure almost perfect.

2. Open the sac before dissecting it out of the canal in all cases where you are unfamiliar with the structures you meet. Remember that the hernial sac has sometimes no other coverings than the skin, and that the interior has often very strange lodgers. Clogg, Connell and Ferguson all reported cases of the uterine appendages in these sacs. Heaton reports a case with the appendix in the sac. Lucy Waite reports a case where the bladder was accidentally opened, mistaking it for the sac. Shimonek had a similar experience with a diverticulum of the bladder closely adherent to the mesial side of the sac, and the author reported a case of colloid cyst within the sac. In short, be prepared for everything when you operate on a femoral hernia.

3. Always bear well in mind the normal courses of the superficial and deep epigastric arteries, and be prepared to meet anomalous conditions of these two arteries in operating for strangulated hernia. If you injure any vessels, ligate them at once with catgut, and do not put your faith in twisting or compression.

4. Avoid constriction of the femoral vein when you tie the outer Bassini suture, the only suture lying close to the vein.

5. Use no other suture material than chromicized catgut or kangaroo tendon.

SURGICAL POSTURES.

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(Concluded from the September number.)

TRENDELENBURG'S POSTURE IN CONGENITAL HIP DISLOCATION.

The equilibrium of the pelvis is maintained by the action of the gluteus medius and gluteus minimus. If a healthy individual stands upon one leg the other limb being flexed at the thigh and the knee, the

Fig. 59. Trendelenburg's Posture in Congenital Hip Dislocation.

gluteal fold on the side of the flexed limb will be on a level with the fold of the limb in standing. (Fig. 59.) If the same maneuver is repeated with the patient standing on the limb corresponding to the congenitally dislocated hip and the sound limb be held in flexion, the pelvis will sag on the sound side so that the gluteal fold here will be on a lower level than the opposite one. This tilting of the pelvis towards the side opposite to the standing limb is due (Trendelenburg) to the inefficiency of the abductors of the thigh, the glutei medius and min-

imus to right the pelvis because of the change in direction of their line of traction.

Artificial Respiration.

In the execution of artificial respiration the effort is made to rhythmically expand and compress the chest in order to bring about respiratory movements.

Fig. 60. Posture in the Expiratory Phase of Artificial Respiration.

The expiratory movement is accomplished by grasping the elbows and forcibly adducting the arm to the lateral thoracic wall. (Fig. 60.) Conversely, for the performance of an inspiratory movement the arms should be abducted and fully elevated above the head (Fig. 61), so that the pectoral muscles expand the thorax.

The alternation of these two movements should be executed rhythmically, the number of such movements in a given time corresponding to what one would consider normal—that is to say, eighteen or twenty to the minute.

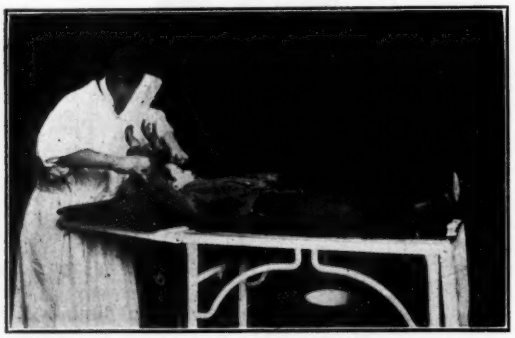

Fig. 61. Posture in the Inspiratory Phase of Artificial Respiration.

Bimanual Examination of the Pelvic Contents.

By this is meant an examination with the fingers of one hand in the vagina, the fingers of the other hand upon the abdomen. For that reason this is quite as frequently referred to as the abdominovaginal examination. The patient is placed in the dorsal posture, the head and shoulders are slightly supported by raising the head of the table, and the knees are drawn up, the feet resting flat on the table or in stirrups. The internal hand (Fig. 62) is placed within the vagina, with the fingers arranged as follows: the index and middle fingers are

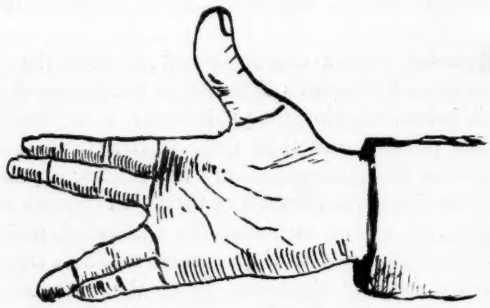

Fig. 62. Arrangement of Fingers Preparatory to the Introduction of Middle and Index Fingers Into the Vagina.

extended and they alone are inserted into the vagina, the thumb being abducted so that it overrides the symphysis and the ring and little finger are flexed into the palm, so that they lie against the perineum. The external hand is placed just above the pubes.

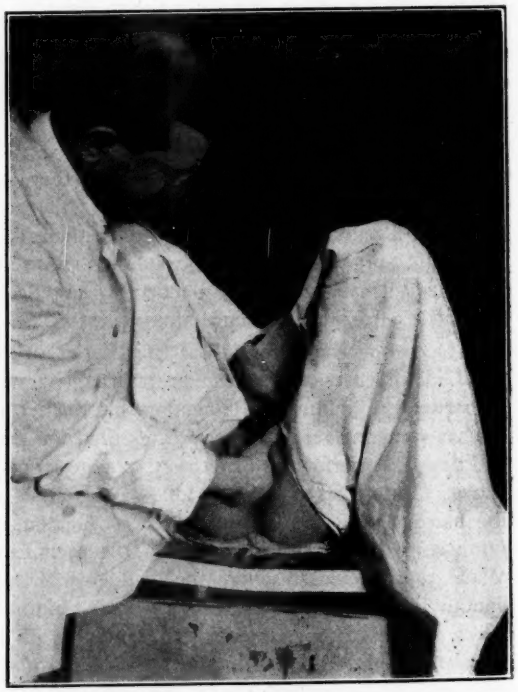

Fig. 63. Relative Position of the Hands in Bimanual Examination of Pelvic Contents.

(Fig. 63.) This hand is to be gradually depressed. The uterus is first felt and steadied with the palm and ulnar aspect of the hand and the lateral surfaces of the uterus and the appendages are to be palpated with the fingers.

SIMS' POSITION—(SEMI-PRONE POSTURE).

The patient lies upon the left side with the left half of the face in contact with the pillow. The left arm should be comfortably placed alongside of the body and the right arm should be flexed and rest upon the thorax. The hips are placed close to the

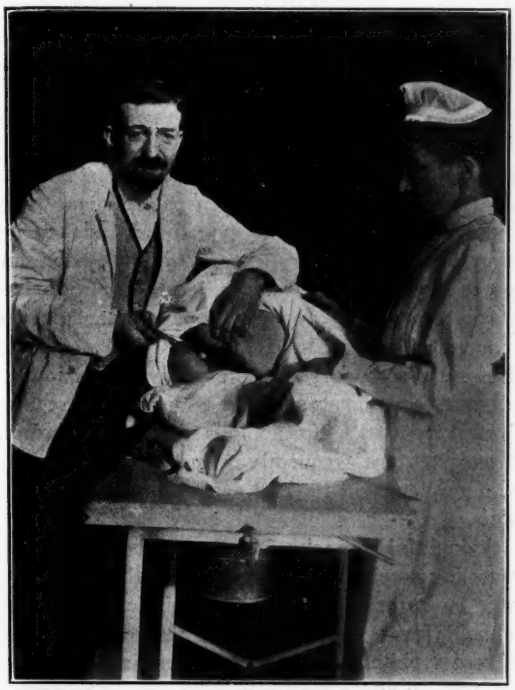

Fig. 64. Sims' Posture.

edge of the table, the knees being well drawn up, the right one more than the left, so that the right knee touches the table upon its inner aspect. (Fig. 64.) In consequence of this posture—an evolution of the genu-pectoral position—the vaginal walls separate readily upon introducing the speculum.

BRAIN TRAUMATISMS.

The average practitioner is weak on the diagnosis of brain traumatisms. In the presence of these cases he is liable to grow bewildered, attempting to recall the text-books' symptoms, their variations, and all the "ifs" and "ands" relative thereto.

But these are cases where definite notions are necessary, for the responsibility of their management rests upon the general practitioner. These cases are his by right of eminent domain. At any rate, the *first treatment* falls to him, and here, as in most cases of traumatism, it is the first treatment which is most likely to determine the subsequent history of the case.—J. W. SLUSS in the *Lancet-Clinic*.

BLOOD EXAMINATION IN SURGICAL DIAGNOSIS. A PRACTICAL STUDY OF ITS SCOPE AND TECHNIC.

BY IRA S. WILE, M.D.,
NEW YORK CITY.

(Continued from the September number.)

SAPREMIA
SEPTICEMIA
PYEMIA

In saprema, septicemia and pyemia the important hematological condition to be especially noted is the rapidly increasing anemia. The degree of anemia parallels the virulence of the infective agent. The more virulent the infection, the more severe and rapid is the induced anemia. In very intense infections, the fall of red corpuscles and hemoglobin can be noted from day to day. The red corpuscles may fall as low as 750,000. This is particularly likely to occur in puerperal sepsis. The red cells will show varying grades of poikilocytosis and degeneration. Punctate basophilia is not uncommon. Normoblasts appear early is the course of the anemia. The rapidly increasing anemia in a surgical case speaks for sepsis as opposed to typhoid fever.

The question of leucocytosis has been discussed and may be summed up here as follows: The degree of infection being the same, the patient with the stronger vital resistance will exhibit the higher leucocytosis. Usually the leucocytic increase is moderate (15,000—20,000). In a case of suppuration of the thoracic duct, the leucocytosis rose to 200,000. In very mild cases of sepsis or very severe cases where the leucoblastic tissues are practically paralyzed, no leucocytosis occurs. Under such conditions leucopenia is the more usual finding. For this reason the leucocyte count is not absolutely reliable for the surgeon when the question of septicemia arises. The polynuclear neutrophiles are usually increased in sepsis, both relatively and absolutely. This relative leucocytosis is of greater diagnostic value than the total leucocyte count. Basophiles and myelocytes frequently appear.

Iodophilia is present in almost all cases of sepsis even when leucocytosis is absent. The more severe the infection, the more the certainty of the presence of an iodophilia. In puerperal sepsis the iodophilia is especially intense.

Blood cultures at present have not a sufficiently simple technic for the general surgeon who is not affiliated with a reliable laboratory upon which he can rely for cultural technic work. The interpretation of the results of blood culture is simple when the invading organisms are culturally isolated. When the blood cultures are sterile, the interpreta-

tion must be merely negative. An undiscovered organism cannot be wholly excluded.

SYPHILIS.

Blood examinations in primary syphilis are of little definite value. In the secondary and tertiary stages valuable data are procurable for differential diagnosis.

Primary Stage. There develops an exceedingly mild degree of anemia. The red corpuscles are scarcely altered quantitatively. The hemoglobin is slightly reduced. This moderate "syphilitic chlorosis" progresses until the secondary stage develops. The hemoglobin may fall 15%—30%. The hemoglobin does not return to its previously normal percentage even after continued treatment. The leucocytes are unaltered except for a slight relative increase of the lymphocytes. The administration of mercury or potassium iodid causes a slight leucocytosis with an increase of the polynuclear neutrophiles.

Secondary Stage. A pronounced chlorotic anemia characterizes the secondary stage of syphilis. The red corpuscles are greatly decreased in number. They may be reduced to 2,000,000. The hemoglobin decreases 25%-50%. The degree of the anemia is dependent upon and indicative of the intensity of the syphilitic infection. The blood alterations are more pronounced in women than in men. In children the anemia may suffice to clear up a doubtful case for the blood alteration is early. With a profuse eruption and secondary adenitis leucocytosis becomes evident. The leucocytosis is moderate, rarely reaching 25,000. There is a relative lymphocytosis, usually well marked. Of great importance, also, is a slight degree of eosinophilia. The basophiles are frequently increased, but I believe this is not due to syphilitic virus but to errors in nutrition. Leucocytosis in syphilis very rarely occurs before the secondary stage.

Tertiary Stage. The anemia continues. In untreated cases the anemia becomes profound. The tertiary syphilitic anemia may become so intense as to assume the pernicious anemia type. In the severe anemia, nomoblasts, megaloblasts and microcytes appear in the circulation. All forms of degenerations may be present. The hemoglobin is greatly reduced. The color index is usually lower than 1, but occasionally is as high as is found in so-called primary pernicious anemia. The younger the patient the more severe is the anemia. In patients who have undergone treatment, the type of anemia varies from the milder chlorotic type to the moderately severe pernicious type. The blood condition improves considerably under the favorable influence of mercury and iodids. Leucocytosis is less evident than in the secondary stage unless tertiary lesions as gummata are numerous. The lymphocytes are relatively increased. Eosinophilia is very noticeable. Myelocytes are frequently found. Severe anemia with myelemia in tertiary syphilis is of bad prognosis.

A doubtful case with fever occurring in an adult, revealing a relative lymphocytosis with eosinophilia may be suspected as being syphilitic rather than typhoid fever, tuberculosis, or malignant disease. Severe syphilitic anemia is characterized by a low hemoglobin and a high lymphocytosis. The accompanying table will help differentiate syhilitic anemia of the pernicious type from the so-called primary or idiopathic pernicious anemia.

Severe Syphilitic Anemia	*Color index* usually less than 1.	*Leucocytosis* present	Normoblasts predominate
Primary Pernicious Anemia	*Color index* usually more than 1.	*Leucocytosis* absent.	Megaloblasts predominate

The following table will serve to assist to differentiate the various forms of adenitis:

	LEUCOCYTOSIS	DIFFERENTIAL LEUCOCYTOSIS.	NORMOBLASTS	MYELOCYTES
Syphilitic Adenitis	Present	Lymphocytosis	Only in severe anemia	Few, rarely
Hodgkin's Disease	Rarely	Normal or lymphocytosis	Absent	Absent
Secondary Adenitis	Present	Polynuclear neutrophilic	Absent	Absent
Tuberculous Adenitis	None or leucopenia	Normal	Absent	Rarely
Malignant Adenitis	Present, usually high	Polynuclear neutrophilic	Only in severe cachexia	Few
Leukemia Myelogenous	Very high, usually over 50,000	Myelocytes; eosinophiles; and basophiles	Numerous	High; average 35%
Lymphatic	Ditto	Lymphocytes	Numerous	None or few.

Justus' test possesses a doubtful value. It oc-

curs in some non-syphilitic affections and is not found sufficiently often in primary or early secondary syphilis to be of diagnostic service. The test consists of first, noting the hemoglobin of the suspected syphilitic patient; second, the administration of a single dose of mercury best by inunction; third, the hemoglobin is taken several times during the first twenty hours following the administration of mercury; fourth, the hemoglobin is noted on the following days. In congenital syphilis and in secondary and tertiary syphilis a drop in the percentage of hemoglobin of 10%-20% will be observed during the first twenty hours. After this period, the hemoglobin arises to a point higher than it was previous to the administration of mercury.

TUBERCULOSIS

Tuberculous infections *per se*, have little or no effect upon the blood. The anorexia, gastro-intestinal disturbances, impaired nutrition and hemorrhage cause most of the blood alterations noted in uncomplicated tuberculosis, *i. e.*, without secondary infection. The red corpuscles may be increased above normal, but the individual corpuscles are then smaller than normal and deficient in hemoglobin. This polycythemia is a favorable condition in cases of advanced tuberculosis where abscess formation has not taken place. More commonly the red corpuscles are only slightly decreased or normal. Hemoglobin may be much diminshed causing an anemia of the chlorotic type ("pseudochlorosis tuberculosa"). Hence the corpuscles are paler than normal.

In surgical tuberculosis cases, if the hemoglobin fails to return to normal promptly after operation, it proves the operation has failed to get rid of all the tuberculous foci. All variations of degenerations occur as tuberculous cachexia develops. It is noteworthy that poikilocytosis is less common than in malignant cachexia. Normoblasts, which are so numerous in malignant cachexia, do not occur in tuberculous cachexia even after hemorrhage unless the hemorrhage has been extremely copious and prolonged.

In brief the blood alterations in primary tuberculosis are disproportionately slight compared with the inroads of the disease and the cachexia. Secondary infection is responsible for most of the alterations. The leucocytes are seldom affected while there is freedom from mixed infection. Leucopenia may be present. If secondary invasion of pyogenic organisms assists in giving rise to a septicemia or toxemia leucoctytosis may result.

Injections of tuberculin induce an increase of leucocytes which usually reaches its height synchronously with the fever. There is also a lymphocytosis and eosinophilia. The higher the leucocytosis the more severe is the tuberculosis infection.

Many cases of tuberculosis with impaired digestion, poor assimilation and consequent malnutrition evidence a lymphocytosis. The lymphocytosis may exist even though there is no absolute leucocytosis.

When secondary infection occurs, the polynuclear neutrophiles begin to increase and a moderate absolute leucocytosis takes place. In simple tuberculosis the eosinophiles are not affected; with a secondary infection, the eosinophiles are reduced and in severe infections they are absent. The absence of eosinophiles in tuberculous affections is of unfavorable prognosis. An increase of eosinophiles after a primary decrease bespeaks an improvement of the patient's condition and promises an arrest of the pathological processes.

A slight increase of the basophiles is often encouraging after prolonged forced feeding. It must be recalled that basophiles are often increased after a hemorrhage. In the absence of hemorrhage a moderate basophilia is of favorable significance.

Tuberculous meningitis an exception to the general rule regarding leucocytosis in tuberculosis. In tuberculous meningitis, leucocytosis is generally present, and may be as high as in cerebrospinal meningitis. In my experience the neutrophiles do not reach as high relative percentages in tuberculous meningitis as in that due to the diplococcus intracellularis.

Tuberculous meningitis is an exception to the general rule of tuberculosis save for polycythemia. The polycythemia is due to concentration of the blood resulting from diarrhea or the drain incident to continued exudation. It exhibits no leucocytosis.

Pleurisy of tuberculous origin presents low leucocyte counts as opposed to those due to the pneumococcus.

Tuberculous adenitis affords no leucocytosis unless secondary infection takes place.

Tuberculous osteomyelitis and arthritis reveal no changes until secondary infection takes place. High leucocyte counts suggest abscess formation. This is especially true if the leucocytes rise rapidly. With low leucocyte counts a small abscess may be present though pyogenic bacteria are absent. If, following an operation upon a tuberculous focus, a leucocytosis occurs, secondary infection has developed. If in the presence of secondary infection drainage is free and sufficient, no leucocytosis will be present—or if present, will be very low.

Phthisis itself does not diverge from the general rule of no blood alteration without secondary in-

fection save a varying degree of anemia. Cavity formation is accompanied by leucocytosis with a relative increase of the polynuclear neutrophiles.

Tuberculous infections of the genito-urinary tract are prone to secondary infection and, therefore, present leucocytosis though usually very moderate.

PERITONITIS

The degree of anemia present in peritonitis varies with the extent and nature of the exudative process and the virulence of the infective agent. With infections of low virulence, which are chronic in nature, the anemia may become very prominent. The red corpuscles may fall to 2,000,000 and the hemoglobin as low as 20%. This extreme anemia is more common in a chronic purulent peritonitis than in a serous peritonitis. Serous peritonitis has only a slight effect upon the red corpuscles unless there is marked cachexia, when a varying degree of chlorotic anemia ensues.

In any form of peritonitis (except tuberculous), a leucocytosis is present, if the patient is capable of vigorous reaction. The leucocytosis averages about 18,000, but may be as high as 50,000. The leucocytosis is usually of the polynuclear neutrophilic type. Serous and purulent peritonitis cannot be differentiated by the height of the leucocytosis nor by the nature of the relative leucocytosis. In profound overwhelming peritonitis, a leucopenia may result or the leucocyte count may be normal. This is very important because a low leucocyte count prevents the hematological differentiation of a profound purulent peritonitis from a tuberculous peritonitis. The presence of a leucocytosis excludes tuberculous peritonitis, myalgia of the abdominal muscles and hysteria.

The leucocytosis of peritonitis does not suffice to differentiate peritonitis from intestinal obstruction, ruptured ectopic pregnancy, acute enteritis, or ruptured abdominal aneurism.

INTESTINAL OBSTRUCTION

Intestinal obstruction in itself presents no anemia. Any anemia present is due to the associated disease. The obstruction due to malignant disease or consequent to intraabdominal hemorrhage or occurring during the course of a disease attended with hemorrhage will present an anemia of an intensity varying with the causative factor.

In all forms of intestinal obstruction there is leucocytosis. The leucocytosis is most pronounced when a malignant growth gives rise to the obstruction. The higher the leucocyte count and the more quickly the rise occurs, the more serious is the obstructive condition. If the leucocytes rise to 20,000 during the first twenty-four hours after the onset of obstructive symptoms, gangrene has probably occurred. If there is a leucocytosis of 20,000 to 30,000 on the third day after the onset of the obstruction, the prognosis is favorable for the delayed surgical intervention. If the obstruction continues and the leucocytosis falls to 10,000, there is a likelihood of a gangrenous peritonitis. With so low a count the ability of the patient to react from the operation is very doubtful. The leucocytosis is generally of the polynuclear neutrophilic type.

CONSTIPATION

Constipation, when moderate, has practically no effect upon the blood. Chronic constipation shows a moderate anemia with either a normal number of red corpuscles or a polycythemia.

The leucocytes are unaltered unless obstruction arises from fecal impaction, when a leucocytosis occurs.

(To be continued.)

SOME DICTA IN APPENDICITIS.

I. When on placing the left palm on the rigid muscles of the lower right quadrant, and on gentle pressure the other hand on the left side of the abdomen, an impulse or beat is felt, the diagnosis of appendicitis can be conclusively made.

II. Severe symptoms are not always signs for grave pathological lesions, and conversely mild symptoms are in many cases accompanied with most serious pathological processes.

III. Never omit to order an enema with turpentine as long before the operation as possible, to give the patient the benefit of the doubt, if you suspect intestinal worms.

IV. The application of ice, sufficient to completely freeze the abdominal wall and viscera beneath it, is a scientific blunder equal to the giving of morphine to cure the malady. It masks the symptoms and is liable to cause gangrene of the skin.

V. Always save the pathological specimen, preserve it and have it carefully labeled with the name and address of the patient from whom it is removed. It is valuable evidence in conjunction with careful records of the case, in suits for malpractice or any other medico-legal complication which may unexpectedly arise.

VI. Probable diagnosis of appendicitis is sufficient cause for surgical intervention, while missing links to the chain of symptoms, to make a positive diagnosis, may deprive the patient's chance of recovery through operative delay.—GEORGE I. MILLER in the *Medical Times*.

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WALTER M. BRICKNER, M.D., Editor

NEW YORK, OCTOBER, 1907.

A RÉSUMÉ OF THE WORK IN BLOOD-VESSEL SURGERY.

Although many attempts have been made to close wounds in bloodvessels, to unite severed arteries and to replace the diseased portion of one artery by another, it is only within recent years, since the advent of aseptic surgery and the improvement in general surgical technic, that the various experimenters have been at all successful. The experiments of the past few years by such men as Carrel and Guthrie, have opened up a wide field, and these earnest workers are to be complimented on their remarkable accomplishments.

In bloodvessel work "the ligature, which during the middle ages waged a constant warfare with cauterization, compression and other methods of hemostasis, was toward the end of the eighteenth century recognized as the best method of controlling hemorrhage from large and small bloodvessels. Inasmuch as ligation of the large vessels not infrequently gave rise to gangrene and sometimes caused loss of life, this method was not an ideal one. Some years elapsed, however, before further progress was made; then surgeons began to apply the lateral ligature in partial wounds of veins where the continuity of vessels was not interrupted. This method was first used successfully about the beginning of the nineteenth century, but as was the case in other branches of surgery, first came into general use after the introduction of antiseptics. The lateral ligature has the disadvantage that it can be used in only a limited number of cases, for if the wound in the vessel is large the ligature will produce considerable narrowing of the lumen and there is danger of the ligature slipping. To meet this difficulty various clamps were devised for approximating the edges of venous wounds during the process of healing, but the great objection to this method, although it was a step in the right direction, was that it prevented primary healing of the cutaneous wound."

The work on arterial anastomosis before 1882 was very unsatisfactory principally because strict asepsis was necessary for successful results. At this time, Schede introduced the employment of venous suture to severed veins. Later Gluck tried to suture longitudinal wounds in arteries but the results were unsuccessful because of the hemorrhage from stitch holes. The credit of the first successful cases is due Jassinowsky who in 1889 sutured longitudinal and transverse openings in the arteries of thirty dogs with only four failures.

But since the time of Jassinowsky experimenters have not been satisfied with merely sewing up wounds in arteries and veins, but have attempted to suture the ends of arteries, to anastomose an artery with a vein, either laterally or by opposing severed ends and, on the theory that an organ can be placed anywhere in the body providing it has proper blood supply and nourishment, have gone so far as to remove a kidney from the loin and place it in the neck of the same animal, anastomosing the ends of the renal vein and artery to the jugular and carotid, respectively.

Naturally nearly all of this work thus far has been done on animals and, although the prospect of being able to accomplish some good in man by reversing the blood stream in various arteriosclerotic conditions, especially of the extremities, is encouraging, the general surgeon as yet is wary about employing such uncertain methods, with such uncertain results. One cannot help commending what has been done already in the experimental field; but one must also remember that the human organism, with its highly developed nervous system and its various sympathetic plexuses around the large vessels, requires a more perfect technic.

The circular suture of arteries was first accomplished by Dr. Robert Abbe in 1894. He divided the femoral artery in a dog and united it again over an hour-glass shaped tube of glass. The operation was apparently successful although, when that portion

of the vessel was removed later, the glass tube was lying free within it. Murphy in 1896 did some excellent work along this line and a few years after this Payr introduced his prothesis of magnesium. Finally in 1902, many investigators published interesting articles on this subject, viz., Salvia, Carrel, Thomasell, etc.

Many methods of circular suture have been employed—the interrupted, the continuous, the mattress, the continuous and interrupted, with or without the use of an absorbable cylinder in the lumen of the vessels. It must be admitted that most of the successful results in animals were purely operative successes and did not prove for one moment that the result would have been the same in a diseased condition of the vessel or in the diseased parts that vessel might have to supply.

The best and latest method for the suture of either arteries or veins, approximated to their respective parts or to each other, is that published by Carrel:

"In 1902 Carrel published a method of circular suture, which, while differing very little from certain methods previously employed, has greatly facilitated such sutures. The ends of the vessels to be sutured are first united by three tension sutures of fine silk, inserted at equidistant points on its circumference. Traction on these sutures approximates the edges of the vessel and renders the application of a continuous suture comparatively easy. In his original communication Carrel recommended avoiding the intima, where possible, but in his later experiments the sutures have included the entire thickness of the vessel wall. He has made no systematic study of the circulation of divided arteries and veins but by applying his method to arteriovenous anastomoses and the transplantation of vessels and organs has obtained brilliant results." Carrel first boils his sutures, of the finest silk threaded on the finest needles, in vaselin and keeps up the tone of the vessel with an isotonic salt solution.

Some of the first attempts at arteriovenous anastomosis were made by St. Martin. He united the femoral artery in Scarpa's triangle to the femoral vein in two cases of arteriosclerotic gangrene of the foot, but both patients had to undergo a subsequent amputation, so these cases must be classed as unsuccessful. What may be called a partial success was obtained by Hubbard in 1906, in a case of a patient with dry gangrene of the toes. An arteriovenous anastomosis of the femoral vessels resulted in an increase of the blood supply to the parts below, but the gangrene subsequently spread to the tarsometatarsal joint and an amputation at the middle of the leg was necessary later.

Jassinowsky, as far back as 1889, came to the following conclusions as the result of his experiments: 1. The arterial suture heals by first intention; 2. Bleeding after operation can be surely and completely avoided; 3. Secondary hemorrhage and thrombosis are not to be feared; 4. Suture should be done in all recent, clean, longitudinal, oblique and flap wounds not exceeding one-half the circumference of the vessel; 5. The strictest asepsis is necessary: 6. The suture is easily done. These desiderata must be taken strictly into account, especially the application of perfect asepsis which is the keynote to all successful work in this field, of course keeping in mind that the operative ability of the surgeon counts for a great deal.

Stephen H. Watts, the author of "The Suture of Bloodvessels. Implantation and Transplantation of Vessels and Organs. An Historical and Experimental Study," which appeared in the September issue of the *Annals of Surgery,* and whose article forms the basis of this editorial, has done some excellent work in this field. He has used the suture method of Carrel. The common carotid artery was sutured thirteen times. In no case was there a sign of thrombus formation and apparently every case was successful. The femoral artery was sutured twice, thrombosis occurring both times as the result of wound infection. In thirteen like operations on the jugular vein, ten were successful. The suturing of the common carotid artery to the jugular vein was successfully accomplished in four instances. In performing the same operation on the femoral vessels four times, the operation was successful in only one instance. He summarizes his results as follows:

"In reviewing our experiments we find that of thirty-one experiments upon the vessels of the neck twenty-eight were successful, whereas of twelve experiments upon the femoral vessels only two were entirely successful. This discrepancy is not difficult to explain. Wounds in the neck are inaccessible to the dog's teeth, and can be readily bandaged, the wounds being thus kept clean and dead space obliterated. In the groin, however, it is very difficult to apply a bandage which will remain in place, obliterating the large dead space which is so apt to be present and preventing movements of the leg which interfere materially with a successful vessel suture."

Conclusions as to the possibilities of the suture of bloodvessels must be left to the future. There is no doubt that in the next few years the large amount of experimental as well as clinical work that is being done in this field will have greatly enhanced our knowledge. When the diseased parts of an organism cannot be cured by the methods which are

now in use, it may be possible to remove these diseased parts entirely and replace them by healthy organs from another body. But predictions as to the future of such experimental work as this can be based only on theoretical grounds. The work on human beings in this realm of bloodvessel surgery will be done cautiously until such a time when it will have been practically demonstrated on animals that the operation will not be detrimental to the patient.

H. M. H.

Surgical Suggestions.

A *small* incision and the proper employment of Bier's breast cup will secure exceedingly gratifying results in the management of breast abscesses.

The occurrence after laparotomy of marked distention of the upper abdominal zone, vomiting and collapse, points to acute dilatation of the stomach.

A perforated intestinal ulcer, especially if low down, may give all the signs and symptoms of acute appendicitis. A very high leucocyte count with a high percentage of polynuclears, and the presence of a large amount of fluid in the peritoneal cavity, accompanied by general rigidity, may suggest the diagnosis.

Ten grains of trional (or veronal) the night preceding an operation, and a quarter of a grain of morphin one hour before operation, will make an anesthesia easier and more complete and it will not be followed by the usual after-effects of a complete narcosis.

When there is sudden acute pain in the right abdomen accompanied by rigidity of the abdominal muscles and high fever, making a diagnosis of gall-bladder disease or appendicitis probable, a lesion of the kidney should not be excluded, especially if there is sharp pain on pressure in the right costo-vertebral angle.

An inguinal hernia giving signs of obstruction and partially reducible, may empty into a properitoneal sac in Hesselbach's triangle, a loop of gut being compressed against the neck of the sac.

Care must be taken in resecting the last true rib not to open the pleural cavity; for not only does this produce a pneumothorax, but an extensive subcutaneous empyhysema may also result.

Book Reviews.

Gynecology and Abdominal Surgery. Edited by HOWARD A. KELLY, M.D., F.R.C.S., Professor of Gynecologic Surgery at the Johns Hopkins University; Gynecologist to the Johns Hopkins Hospital, Baltimore, and CHARLES P. NOBLE, M.D., Clinical Professor of Gynecology at the Woman's Medical College, Philadelphia; Surgeon-in-chief Kensington Hospital for Women. *Volume I.* Octavo; 851 pages; illustrated by HERMANN BECKER, MAX BROEDEL AND OTHERS. Philadelphia and London: W. B. SAUNDERS Co., 1907.

The editors propose to combine the subjects of gynecology and abdominal surgery in this work, and for the sake of completeness to include puerperal injuries and infections, treatment of incomplete abortion, ectopic gestation and the Cesarian operations, which conditions fall into the hands of either gynecologists or surgeons depending upon accidental circumstances. If the second volume succeeds in reaching the high standard attained in the first, a monumental work will be the result.

It will be impossible to review each chapter in detail. Of especial interest is the section dealing with bacteriology by Wm. W. Ford. This author has struck a happy medium between technical details and their clinical application; the resulting exposition cannot fail to give a vivid picture of conditions usually realized only after actual and prolonged laboratory experience. Nearly the same may be said of the chapter on the pathology of the reproductive organs by Elizabeth Hurdon, which in the short space of 130 pages gives a very comprehensive view of modern gynecological pathology. The chapter on medical gynecology by Noble ought to appear in monographic form in order that every general practitioner could read and profit by it. This field, namely non-operative office gynecology, and its necessary adjunct—decision between operative and non-operative measures—has never been treated in a superior way. Careful study of this section and application of the knowledge contained in it, would go far to make up for the lack of dispensary training in gynecology, which is found even in hospital graduates, who know how to operate for a large fibroid, but fail to cure an eroded cervix or a catarrhal salpingitis.

The various forms of plastic operations, the vaginal route for celiotomy, abdominal gynecological operations, etc., are considered in numerous chapters. Considerable space is devoted to the preparation and after-treatment of laparotomy patients, and to the celiotomy incision. Howard Kelly has written on gynecological technic; vesical fistulæ; a valuable chapter on the drainage of pelvic abscesses; conservative operations on the ovaries and tubes; and, of special interest, operations before puberty (written in conjunction with E. Hurdon). Radical operation for uterine cancer has been assigned to John G. Clark; the Byrne method of treatment of carcinoma of the uterus to X. O. Werder. The chapters on "Non-plastic operations of the vulva and vagina," and on "Combined gynecologic operations" do not quite reach the high standard set by the others already mentioned. The illustrations are exceptionally good; among them several well known plates from Kelly's Gynecology reappearing. Full references to the most recent literature appear as footnotes and add to the value of the work as a book of reference.

Practical Fever Nursing. By EDWARD C. REGISTER, Professor of the Practice of Medicine in the North Carolina Medical College; Chief Physician to St. Peter's Hospital; Editor of the *Charlotte Medical Journal.* Illustrated. Philadelphia: W. B. SAUNDERS COMPANY, 1907.

It has been a matter of just pride that nursing has reached a greater development in this country than in any other, and that its importance in the healing of the sick is here fully appreciated. In the treatment of fevers especially, a good nurse is in most instances of far more importance than a formidable array of drugs. It is therefore a pleasure to greet the book before us, which in our opinion fills a definite want.

The author has introduced the most salient features of the pathology, diagnosis, prognosis and treatment of the diseases under discussion in order that the nurse may have an intelligent knowledge of the diseases which she must aid in combating. The author has on the whole performed his labor very satisfactorily and we venture to say that a nurse who masters the contents of this book should prove to be a very competent one. The author's views in the main are orthodox; only in the treatment of typhoid fever do some of his views differ from those in common acceptance. For instance, he believes that alcohol has but a very limited use in typhoid fever and is not indicated in more than ten per cent. of the cases; he prefers buttermilk to sweet milk as a diet; he does not approve of antipyretics but he gives salol as an "intestinal antiseptic" in most cases. The illustrations are of uneven merit. Those on the proper method of tubbing are excellent. On the other hand, the illustrations showing the methods of administering a hypodermatic injection and a dose of antitoxin show very little, because the photographs portray the objects on too small a scale. The pictures of the plasmodium malariae on page 181 are unusually poor. This is a book whose value should appeal just as much to the medical man as to the trained nurse.

A Manual of Diseases of the Nose, Throat and Ear. By E. B. GLEASON, M.D., LL.D., Clinical Professor of Otology in the Medico-Chirurgical College; Aurist to the Medico-Chirurgical Hospital; Surgeon-in-charge of the Nose, Throat, and Ear Department of the Northern Dispensary; formerly one of the Laryngologists to the Philadelphia Hospital. Illustrated. Philadelphia and London: W. B. SAUNDERS COMPANY, 1907.

This is one of the most satisfactory manuals on the subjects with which it deals that we have seen in a long time. The text is remarkably concise; the author has eliminated all controversy and has advocated only such methods as have proven of value to him. He handles the subject in a straightforward, sure style, that leaves nothing to the imagination. The descriptions of technic and of operations are given in detail, rendering the book of vast value to the beginner. In a careful perusal of the book, we have noted practically nothing with which we might disagree. The illustrations are profuse and of uniform excellence. The text is systematically arranged and the type is of readable dimensions. The book makes a "handy" volume, is covered with soft leather and is exactly the kind one would prefer to leave on the desk for ready reference.

Progress in Surgery.

A Résumé of Recent Literature.

Intradural Resection of the Posterior Roots of a Number of Spinal Nerves for the Relief of Intractable Pain. GEORGE W. JACOBY, New York. *New York Medical Journal*, August 3, 1907.

This operation was first suggested and performed in 1888 by Dana and Abbe. Up to the present, the operation has been carried out fifteen times, but in the opinion of the author the operation has not received the commendation that it deserved. This is due partly to the fact that there is a prevalent idea that the operation is more formidable than the condition warrants, and partly to the notion that the operation may be followed by grave lesions of the cord. Both of these contentions the author proves with satisfaction to be erroneous. As indications for this operation he offers the following: 1. Persistent neuralgias of mixed nerves in which the motor functions of the nerve are intact and in which these are of sufficient importance to warrant their preservation. 2. In neuralgias of radicular origin. 3. In symptomatic neuralgias in which the cause of the pain can be abolished by no other means, and as a palliative measure when the causative affection is irremediable, yet pain must be suppressed. Of course, whenever this operation is considered an accurate diagnosis of the roots involved is absolutely necessary. This is to be determined by the neurologist. The author gives a few technical directions as to the manner in which the operation is to be performed. No traction should be made on the proximal or the distal end for fear of damaging the cord and anterior root respectively. The nerve is to be lifted out and cut at the level of the cord; the peripheral end is held in some tension and cut at the place where it pierces the dura. The author reports a case in which the operation was performed with success. The patient had sustained a crushing injury of the hand necessitating amputation at the wrist. Persistence of pain necessitated repeated amputations, the last through the arm. All these measures, however, were of no avail. The fifth to the eighth cervical and the first dorsal roots were resected. The patient made a good recovery and the pain ceased entirely and permanently. Jacoby has collected instances of fifteen operations from the literature. Two died. Of the remainder eight obtained complete and permanent relief. In five there was amelioration.

Ligature of the Renal Vessels by the Transperitoneal Method for the Cure of Persistent Renal Fistula. W. P. HOLT, Dublin. *Lancet*, June 8, 1907.

The patient's renal fistula was due to traumatic rupture of the kidney with secondary abscess formation. Four attempts at nephrectomy were made, but in each instance the operation had to be abandoned owing to profuse hemorrhage and the difficulty of recognizing the kidney from scar tissue. These possibilities according to the author are commonly present in attempts at nephrectomy for urinary fistula. As a final resort, Hall ligated the renal artery transperitoneally. On the fifth day the discharge from the wound became odorless and healing was complete on the fifty-seventh day. As far as the author is aware this operation has never been done before for this condition.

The Present Status of Spinal Anesthesia (*Der gegenwärtige Stand der Spinalanalgesie*). M. STRAUSS, Greifswald. *Deutsche Zeitschrift für Chirurgie*, July, 1907.

This article is based on personal observations, and on statistics from the literature, covering in all 22,717 applications of the method. In all, there were forty-six deaths, of which Strauss regards seven only (1:2524) as unavoidable. The other fatalities are ascribed to causes not connected with the method, such as errors in technic. He concludes, that tropococain is, at present, the least dangerous of all the drugs used, although a number of unpleasant symptoms and sequelæ may be ascribed to it. In some cases it has also caused death. The dose of the drug should always be too small rather than too large; 0.06 grms. (1 grain) of tropococain is sufficient for all cases. Elevation of the pelvis and aspiration of large quantities of cerebrospinal fluid permits of the surest and most extensive distribution (especially upward) of the analgesia. Adrenalin appears to increase the dangers and is harmful. Dangers and non-success are avoided by the careful following of the prescribed technic, but cannot be avoided entirely. The average duration of the analgesia is one hour. Successful analgesia of the perineum, lower extremities and lower part of the abdomen can be obtained in nearly every case. There are distinct indications and contraindications. The method is recommended in old, decrepit patients, in non-tubercular lung affections and in diabetics; it is contraindicated before the age of fifteen years, in neuro- or psychopathic conditions, in brain or spinal disease, septic conditions and where local anesthesia will suffice. Great care should be exercised in tuberculosis, lues, kidney disease and advanced arteriosclerosis (especially of the brain). In well selected cases the method has distinct advantages and the best way to improve the results is by carefully choosing the proper cases.

Introduction of Fluid into the Interior of the Uterus After Premature Rupture of the Membranes (*Wiederauffüllung des Uterus nach vorzeitigem Blasensprung, nach dem Vorschlag des San.-Rat Bauer*). PETERS. *Zentralblatt für Gynäkologie*, July 29, 1907.

Rupture of the membranes occurring early, before complete dilatation of the cervix, is often followed by the loss of large quantities of the liquor amnii. This is especially true in malpresentations. Consequently either internal or

combined version is rendered doubly difficult or impossible. Peters describes a cervical bag through which passes a separate soft rubber tube which projects slightly above the upper margin of the bag, and is slightly excentric in position. After the bag has been introduced into the cervix, in the usual way, and its interior filled with fluid, traction is instituted in order both to bring about the necessary dilatation and to shut off the uterine cavity. Now sterile water or salt solution is forced into the uterus by means of a Potain apparatus connected with the separate tube; as little as 400-500 c.cm. of fluid helps greatly to make the fetus more mobile and protects it from pressure.

The Treatment of Ulcers Situated Over the Saphenous Vein (*Zur Therapie der auf der Vena saphena liegenden Unterschenkelgeschwüre, die nicht mit Varicen kompliziert sind*). A. WEISCHLER, Hamm i. W. *Zentralblatt für Chirurgie*, July 6, 1907.

If varicose veins are found coincidently with ulcers of the leg, the connection between the two conditions is evident and surgical removal of the offending veins is indicated. The author has found, however, that chronic ulcers situated along the internal saphenous vein, in the neighborhood of the ankle, may be due to uniform dilatation of the saphena, although no varicosities have developed. In favorable cases the dilated vein may be observed to course immediately along the base of the ulcer. Under these conditions excision of the vein as far upward as the knee, or even to the saphenous opening, combined with excision of the ulcer and complete suture of the wound affords prompt relief and effects a permanent cure. At least one inch of the vein, below the ulcer, should also be excised. In the leg, subcutaneous excision is not practicable, as too many small lateral tributaries are encountered, but above the knee this method is regularly employed. Whether ulcers on the external surface of the leg are relieved by similar measures cannot be positively affirmed by the author as his material has not been sufficient to permit of an authoritative opinion.

Resection for the Relief of Intestinal Obstruction. W. J. MAYO, Rochester. *Journal of the American Medical Association*, September 14, 1907.

Mayo says that the important considerations in resection of the intestine for obstruction are, first, the degree of vascular involvement; second, the degree of infection; third, amount and toxicity of the obstructed intestinal contents. These latter not only poison the system through the intestinal walls, but are liable to regurgitate into the stomach, producing fecal drowning during anesthesia, and may poison the intact intestine below if permitted to escape that way after resection. Treves says that the mortality of resections for obstruction was decreased one-half after it became customary to evacuate through incision instead of allowing the intestinal contents to pass down into the healthy gut, where they were absorbed. Vascular changes are greatly increased also by the distension, hence, it is advisable to go well above the seat of the disease to secure healthy intestine, and to use the utmost care in handling, so as not to increase the vascular damage. In searching for the seat of obstruction it is well to go down to the ileocecal junction and work upward along the collapsed intestine, rather than to handle the distended gut. If the abdominal incision is badly placed, so that one can not reach the obstruction without tension on the mesentery, it is better to make a second incision. This is particularly true in strangulated femoral hernia. Mayo prefers lateral anastomosis with end-closure by the two-row suture method in acute obstruction of the small intestine as safer, keeping well away from the mesentery. The opening should be free and at least three inches long, as insisted on by R. Abbe. For chronic obstruction, end-to-end junction is the operation of choice. The ileocecal junction is a favorable point for operation, and resection here should, as a rule, include the ascending colon, and the ileocolic anastomosis should be lateral, between the lower ileum and the transverse colon near the hepatic flexure underneath the omentum. In resecting the transverse colon, one should remember that in 80 per cent. of cases the middle colic artery is the sole blood supply, hence the need of care to preserve it. Resection for obstruction between the splenic flexure and the rectum is usually best done in two stages, and if for obstruction, it is best to follow the method of Mikulicz and Paul by drawing the affected part out of the abdomen and after separating its mesentery and suturing the two limbs together, to attach it to the abdominal wall with the dressed part outside. After waiting as long as safe for adhesions to form, the obstruction is relieved by a small incision in the distended loop. In from two to four days the projecting portion is cut away, and two weeks later clamps are introduced into the two exposed ends, which gradually cut through the adjoining intestinal walls and re-establish the communication. The fistula gradually contracts and either closes itself or can be closed by a secondary plastic operation. Mayo insists on the following points in the after-treatment of intestinal resection: First, keep the patient's head and chest raised to a semi-sitting position for several days after the operation, for pus to gravitate toward the pelvis, rather than the diaphragm. Second, especially in obstruction of the small intestine, it is necessary to use rectal infusions of salines, from four to six quarts in the adult, during the first twenty-four hours, as recommended by Murphy, to aid elimination and to relieve dehydration. Third, the stomach must be carefully and repeatedly emptied and irrigated if there is any tendency to prolonged nausea or vomiting.

The Treatment of Gonorrheal Infections by a Specific Antiserum. J. ROGERS and J. C. TORREY, New York. *Journal of the American Medical Association*, September 14, 1907.

Referring to their previous communications on the subject the authors publish further results of experiments with the serum treatment of gonorrhea. The method of producing the serum is described. At first rabbits were employed exclusively, but their serum was found to be toxic to some individuals and the same is true of goat serum. Therefore, the serum of sheep, which was found innocuous, was used in their later experiments. The serum has always been given in small doses, viz., 2 c.c. or about 40 minims. Larger doses were not tried, as these were found sufficient. The treatment was found efficacious in some complications, but not specially so in acute urethritis, vaginitis and conjunctivitis. The complications thus amenable are classed by the authors as follows: 1. Those arising by direct extension of the primary infection into organs like the prostate, epididymis, testicle, bladder and Fallopian tubes in direct continuity with primary focus. 2. Those due to the entrance of the germ into the circulation directly or through the lymphatics, such as iritis, arthritis and endocarditis. General peritonitis may be more properly included in the first class. Case reports showing the effects of the method in these various conditions are given. The authors believe that the serum causes a local disintegration of the gonococci and a liberation of endotoxins. The primary bactericidal action seems to the authors more probably due to the presence of specific immune bodies in the serum than indirectly by phagocytic action and opsonins. Experiments which will be published later indicate that immune bodies are present in abundance. It is possible, however, that the gonotoxin liberated in the tissues indirectly may play an important part in the curative process by causing an influx of exudate containing leucocytes and that these phagocytic cells destroy the remaining gonococci more readily through having been acted on by the serum. There is no evidence that the serum is in any sense an antitoxin.

Glycosuria in Its Surgical Relations. A. E. HALSTEAD, Chicago. *Journal of the American Medical Association*, September 7, 1907.

A. E. Halstead discusses the relation between traumatism and certain surgical diseases and sugar in the urine. After noticing the work of Redard, Hadke and Kausch in this line, he reports his own observations. He has examined in this regard fifty cases of fracture, six of them fractures of the vertebræ. In three of the latter sugar was found; in two directly after the injury, one patient dying on the second and the other on the third day. The third glycosuric patient died on the twelfth day; all the non-glycosuric patients lived over two weeks. Of the remaining forty-four patients, all of whom had simple fractures —six had sugar in the urine for periods of twelve or four-

teen days; in none were there other signs of disturbed sugar metabolism or was the healing of the fracture influenced. The chief significance of these observations, in his opinion, is in their pointing to shock or cerebrospinal concussion as the principal cause of the condition. Such ephemeral glycosuria does not seem to have any influence on the healing of the injury. Nevertheless, he would postpone operations that are not imperative until the disappearance of the sugar. A more permanent glycosuria might possibly result from the shock of operation or the anesthesia, and the chances of non-union be greatly increased. The secondary transitory glycosuria due to drugs or infections does not seem to affect the prognosis of surgical infections greatly, but, according to Halstead, it should cause the postponement of major surgery while the needed measures for its relief are being carried out. It is not a contraindication, however, to necessary minor surgical procedures, but rather the reverse. In long-continued suppuration the possibility of a secondary glycosuria becoming permanent must be kept in mind. In erysipelas, sugar in the urine is of serious prognostic moment, as an index of the severity of the infection. In diabetes, imperative operations have to be risked, and, from his review of the evidence, Halstead does not think that we can always take the quantity of sugar excreted as a guide to the safety of an operation. Other substances, acetone, diacetic acid, etc., indicate a greater danger of coma than any quantity of sugar alone. He would try a thorough course of treatment in case a high percentage of sugar is present, before performing any operation that can be postponed. Under aseptic conditions, except in the lower extremities where the circulation is likely to be impaired, wounds heal rapidly in diabetes. The dangers incident to infection, however, are increased and operations that are avoidable should not be considered. Too much stress cannot be laid on the importance of a rigid course of preliminary medical treatment. Inhalation anesthesia, even by nitrous oxid, should be avoided so far as possible. In case operation is unavoidable ether is the least, and chloroform the most harmful. Local or regional anesthesia should be the form employed whenever possible. Halstead insists on the importance of prophylaxis as regards gangrene in diabetes. The danger of infection of even insignificant abrasions should be impressed on the patient, and corns, warts and calluses of the lower extremities should receive careful attention and should be treated only under the most rigid antiseptic precautions. When gangrene has occurred the question when and where to operate is of importance, and the condition of the arteries will have to be considered. When the gangrene has reached the dorsum of the foot, obstruction of the popliteal at its bifurcation has possibly occurred and amputation above the knee is always to be advised. A general anesthetic is unnecessary in most cases as spinal cocainization will generally suffice.

A Method to Supply Air to the Child in Cases of Delayed Expulsion of the Aftercoming Head (*Ueber eine Methode, dem Kinde künstlich Luft zuzuführen bei erschwertem Durchtritte des nachfolgenden Kopfes*). W. RÜHL, Dillenburg. *Zentralblatt für Gynäkologie*, August 3, 1907.

Entrance of air has been noted in the cases of vagitus uterinus. In none of these instances were any ill consequences reported. Air entering the uterus while the placenta is yet attached must lie within the amniotic cavity and is therefore harmless. The method as performed by the author can be used either manually or instrumentally; either after disengagement of the arms (which is preferable) or before the arms are loosened. The hand of the accoucheur corresponding to the side toward which the child's abdomen is turned (left hand if belly is turned toward the right and vice versa) is introduced until the tip of the middle finger touches the base of the child's nose. The other fingers are applied to the nasal processes of the superior maxilla and to the canine fassa. The closely approximated fingers now form a trough of which the middle finger occupies the deepest position. The fingers are now all flexed in the second interphalangeal joint to an angle of 45 degrees, while the palm and forearm are crowded away from the child. The other hand of the operator, or that of an assistant, grasps the child at the junction of neck and shoulders and forces its body away from the introduced hand. Space for the access of air is thus obtained.

Rühl describes three cases in which he successfully used these means of preserving fetal life. One case of a small pelvis necessitated pubotomy although the aftercoming head was already engaged. In the second, prolapse of the cord necessitated version and the head was caught by the cervix and not liberated until the cervical ring had been incised. The third case was one of placenta previa treated by means of accouchement forcé.

Trocar-Catheter for Infrasymphyseal Bladder Drainage (*Trokar-Katheter zur infrasymphysären Blasendrainage*). W. STOECKEL, Berlin. *Zentralblatt für Gynäkologie*, July 29, 1907.

Several years ago the author recommended drainage instituted by means of a catheter placed beneath the symphysis between it and the urethra. He considers this method indicated in plastic operations upon the dilated urethra or after the closure of large vesico-vaginal fistula involving the neck of the bladder. The method was first carried out by making a small incision between the clitoris and the external meatus and then pushing a closed pair of scissors as far as the neck of the bladder. Counter pressure was then made by means of the finger introduced either through the patulous urethra or through the vesico-vaginal fistula, until the scissors penetrated the bladder wall. A glass catheter was then introduced and fixed in position for eight to ten days. Upon withdrawal of the catheter the fistula closed at once without leakage.

The method can be simplified by using the special trocar-catheter now described by Stoeckel. It consists of a Swene's metal horseshoe catheter to which a pointed flexible trocar has been added. As now advised the trocar is introduced through a superficial opening, the guiding finger being first passed into the bladder. This step should precede the plastic operation. Some operators first perform the plastic and then introduce the trocar into the dilated bladder without the control of the finger. Under these conditions the bladder wall may evade the point, or the instrument may either enter at the neck of the bladder or penetrate too deeply and injure the anterior vesical wall.

The Indications for Therapeutic Uterine Curettage. R. E. SKEEL, Cleveland. *Cleveland Medical Journal*, September, 1907.

Skeel condemns the indiscriminate use to which this time-honored and valuable operation is subjected. The slogan, "Here is a uterus, let's dilate and curette it," is altogether too prevalent. In incomplete abortion and in certain septic states of the endometrium its use is of course entirely justified. Its employment in leucorrhea, however, is a very limited one indeed. In many instances the leucorrhea is merely a symptom of local congestion due to some general disturbance, such as anemia, neurasthenia, constipation, cardiac or pulmonary disturbance, which manifestly will not be improved by an operation. When the leucorrhea results from gonorrhea it is usually due to involvement of the cervix. Curettage of the cervix will only carry the infection to the body and will be of little avail anyhow. If the body is involved curettage will only aggravate the condition and may bring about infection of the tubes. In dysmenorrhea, curettage avails little or nothing. In certain cases of stenosis of the internal os dilatation will relieve, but the relief only lasts from three to six months. In amenorrhea curettage is absolutely useless. In sterility, it is only justifiable to curette when the husband is competent and there is no gross change in the tubes to account for the condition. Curettage has also been done too frequently for menorrhagia or metrorrhagia. If the bleeding is due to hemorrhagic endometritis and to polypi resulting from abortion, the curette is clearly indicated. There are many menorrhagias of the menopause which are not influenced by curettage. On the other hand, as an exploratory instrument its use may be eminently justified. As a palliative and preparatory measure in fibroids it is useful. Altogether the author believes that a large number of women who are now subjected to this so-called minor treatment are medical and not surgical patients.